THAKUR COLLEGE OF SCIENCE & COMMERCE
(AUTONOMOUS)

FINANCIAL MANAGEMENT

FINANCIAL GOAL SETTING

Introduction:

Finance theory rest on premise that the goal of Firm should be to maximise the value of the form to its equity shareholders. This means that the goal of the form should be maximise its market value to its equity shareholder- which represents the value of the firm to its equity shareholder.

- The management has to establish it's long term financial goals or financial objectives.
- These goal are developed by top management and they usually consist of general statement in term of stating what the company expects to achieve.
- The primary financial goals of a firm are to achieve return on investment, value addition, growth in earning per share, growth in price earning ratio, optimum level of leverage & efficient utilization of short term & long term finances.

Analysis of Financial Performance of Company (Different Parameters)

Traditional Profit Based measures

1. Earning Per Share
2. Return on Capital Employed
3. Return on Ner Worth
4. Net Operational Profit After Tax
5. Earning before Interest & Tax

Trendier Value based performance measure

1. Market Value Added
2. Shareholder Value Added
3. Cash Value Added
4. Economic Value Added

I. Earning Per Share: $\dfrac{\text{Profit After Tax – Preference Dividend}}{\text{No. of Equity Shares}} * 100$

- Interpretation : Higher Ratio indicates higher profitability & higher earning power of equity share.
- The management can maximize their EPS by increasing profitability of the company.

II. Return on Capital Employed: $\dfrac{\text{Profit before interest \& Tax}}{\text{Debt + Equity}} * 100$

- Interpretation : Higher ROI indicates higher overall profitability of the company & good managerial performance.
- The management can improve ROI by improving managerial efficiency & controlling cost.

III. Return on Net Worth : $\dfrac{\text{Profit After Tax}}{\text{Net Worth}} * 100$

- Interpretation : Higher ratio indicates higher overall profitability & higher yield of shareholders fund.
- This can be improved by increasing Net Profit & controlling Cost.

IV. **Net Operational Profit After Tax :** Net Profit
Add: Provisions & Contingencies
Add: Interest on Borrowings
Less: Taxes

V. **Market Value Added:** In order to measure shareholder's value Steward invented the term Market Value Added. It defined as the difference between market value of invested capital & book value of invested capital of a company at given period of time. Thus MVA can be stated as market capitalization less net worth.

MVA = Market Capitalization – Net Worth

A positive MVA indicates that price to book value is greater than 1. If it is negative, it indicates that price to book value is less than 1.

- **Market Capitalization = No. of Equity shares * M.P. per share**
- **Compute Net Worth**

Particulars	₹
Equity Share Capital	XX
Add: Reserves & Surplus	XX
	XX
Less: Accumulated Losses (if any)	
Fictitious Assets	(XX)
NET WORTH	**XX**

VI. Economic Value Added: Stern Stewart & Co., the new York based Financial advisory postulated the concept of economic income in 1990 in the name of Economic Value Added. It is a modified version of residual income concept.

- **Economic Value Added = NOPAT – WACC * Capital Employed**
- **Net Operating Profit After Tax (NOPAT) =**

Particulars	**₹**
Net Profit After Tax	XX
Add: Non-Recurring Expenses	
R&D Expenditure	XX
Interest Expenses	XX
Provision for Tax	XX
	XX
Less: Non- Recurring Income	
R&D amortization	XX
Cash Operating Taxes	XX
NOPAT	**XX**

◈ Weighted Average Cost of Capital:

Source of Capital	Amount	proportion	Specific Cost	Product
1	2	3	4	5 (3*4)
Equity	XX	XX	XX	XX
Debt	XX	XX	XX	XX
	XX	**1**		**WACC =XX**

◈ Capital Employed:

Particulars	₹
Net Fixed Assets	X
Add: Investments	X
Add: Net Current Assets	X
CAPITAL EMPLOYED	**X**

OR

Particulars	₹	₹
A. Net Worth		
Share Capital	X	
Add: Reserves & Surplus	X	
	X	
Less: Fictitious Assets	(X)	X
B. Total Borrowings		
Debentures		X
Loans		X
Capital Employed		**X**

TIME VALUE OF MONEY

1. The basic time value of money relationships can be explained with the help of following equations:

i. $PV = FV^* DF$

ii. $FV = PV^* CF$

Where,

PV = Present Value

FV= Future Value

DF = Discounting Factor

CF = Compounding Factor

2. Standard Deviation = $\sqrt{1/n-1 \sum(\overline{R}i- Ri)^2}$

N = No. of Observations

Ri= Rate of Return

$\overline{Ri}$ = Arithmetic Average of the Rate of Return

3. Bonds in Perpetuity:

$$V= \frac{I_1}{(1+i)^1} + \frac{I_2}{(1+i)^2} + \ldots\ldots\ldots\ldots\ldots \frac{I_n}{(1+i)^n}$$

4. Value of Preference Shares =

$$V = \frac{D}{i}$$

Whare,

V= Value of Preference Shares

D= Annual Dividend per Share

I = Discount rate on preference shares

5. Yield on Preference Shares:

$$I = \frac{D}{V}$$

Whare,

V= Value of Preference Shares

D= Annual Dividend per Share

I = Discount rate on preference shares

6. Constant Growth Model : If dividends remains same over a period of time, the equation will be:

$$P0 = \frac{D}{r}$$

Where,

P0 = Price of the share

D= Dividend per share
r= Capitalization Rate

7. Growth in Dividends (Normal Growth) also known as Gordon's Model

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

$$P = \frac{D_0 (1+g)}{(K_e - g)}$$

8. Capital Asset Pricing Model (CAPM)

$Ke = Rf + \beta (Rm - Ri)$

Whare ,

Ke = Cost of Equity

Rf = Risk free Rate of Return

Rm = Market rate of return

B = Beta

Questions- Time Value of Money:

1. If sanju purchases a 6 years ₹100 par value bond bearing nominal rate of interest 6%, what should he be willing to pay now to get a required rate of 8% to purchase the bond if on maturity he will receive the bond value at par.
2. If the bond pays ₹60 annually on perpetual bond, the current yield is 8%. Determine value of the Bond.
3. If the coupon rate of interest on a ₹1,000 par value perpetual bond is 6%, the bond's market price is ₹ 800, then determine yield value.
4. Tourin buys a share at the beginning of the year for ₹ 100. He holds the stock for one year. ₹6 in dividends is collected and the share is sold for ₹140.
5. If the price is ₹150 and the dividend is ₹5 what should be the price at which on should sell the stock at the end of one year in order to obtain a rate of return of 40%.
6. A firm has a cash dividend of ₹12 per share and an average growth rate of 5% per annum in cash dividend. The required rate of return of an investor who wishes to purchase stock in 10% per annum. Determine the present value of share.
7. Treasury bonds carry 6.5% interest. Beta factor for the company may be taken at 1.5. The long run market rate of return may be taken at 16.5%. Calculate cost of equity using CAPM.
8. An investor invest a sum of ₹ 12,000 for a period of 3 years at 10% compound interest per annum. How much money would he get back at the end of 3 years.
9. Swaraj has invested ₹1,00,000 in a scheme @10% p.a. compounded half yearly. Find out what will be amount become at the end of one year.
10. Sanjana has invested ₹25,000 in a scheme @12%p.a. compounded quarterly. Find out what will be amount become at the end of 2 years.
11. A deposit of ₹10,000 is made to earn interest @12% p.a. Find out future value of this deposit if the compounding period is :
    I. Annually
    II. Half Yearly
    III. Quarterly
    IV. Monthly
    V. Daily
12. An investor invests ₹60,000 in Bank certificate of deposit for 3 years at 8% interest p.a. Calculate the maturity value of the investment.
13. An investor invested ₹5,50,000 in Bank FD for 4 years at 8.5% p.a. how much will be received at maturity.
14. A bond of ₹1,000 each ahs a coupon GOI rate of 6% p.a. & maturity period is 16 years . if the current market price is 1060. Find Yield to Maturity (YTM).
15. Find out the present value of Equity Share of a Company from the following information:

i. Number of shares invested = 100, Face Value = ₹10 , Market Value = ₹15.

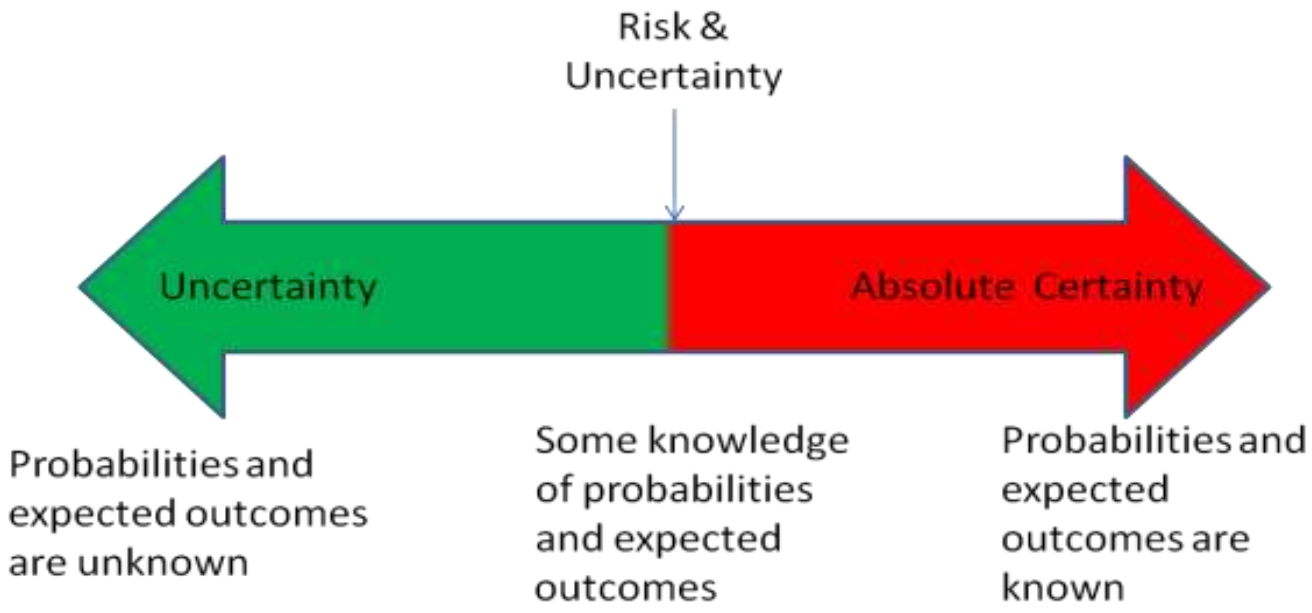
ii. Dividend declared in the last year 15%.

Dividend growth expected in the next 5 year is 10% p.a. Thereafter the growth is 7% over every year for a period of another 5 years. Assume discount rate @10%.

16. On a contract you have chance of receiving ₹15,000, 10 years from now or ₹60,000, 12 years from now. At what rate of compound interest , choosing either of the chance would make no difference.
17. A bond of ₹1,00,000 each ahs a coupon GOI rate of 6% p.a. & maturity period is 18 years . if the current market price is 1,01,800. Find Yield to Maturity (YTM).
18. Treasury bond carry 7% interest rate. Beta factor for the company may be taken at 1.15. the long run market rate of return may be taken at 15.5%. Calculate cost of equity using CAPM.
19. Mr. Mukesh deposited ₹40,000 to earn interest @12%. Find out the future value of his amount if the interest is compounded.
    i. Annually
    ii. Half Yearly
    iii. Quarterly
20. An investor has invested ₹15,00,000in Fixed Deposit for 4 years at 8% p.a. with annual compounding. You are require to calculate the maturity amount.-
21. How much should an investor pay for the bond currently which ahs face value of ₹ 100 & coupon rate of 10%. The bond shall be maturing after 5 years with redemption at par. The investor expects 12% rate of interest.
22. Deposit of ₹1,50,000 is made to earn interest @13%p.a. for 2 years. Find out the future value of this deposits if the compounding is:
    i. Half yearly
    ii. Quarterly
23. Find the effective rate of 12% if the interest is compounded:
    i. Yearly
    ii. Half yearly
    iii. Quarterly
    iv. Monthly
24. Calculate YTM of the RBI bonds of face value ₹10,000 & purchase price of ₹9,900 with a coupon rate of 15% and a period of 15 years.
25. Calculate the value 5 years hence of a deposit of ₹10,000 made today if the interest rate is ;
    i. 8%
    ii. 10%
    iii. 12%
    iv. 15%

Capital Budgeting

- Capital budgeting is the process that a business uses to determine which proposed fixed asset purchases it should accept, and which should be declined. This process is used to create a quantitative view of each proposed fixed asset investment, thereby giving a rational basis for making a judgment.
- Decision making is the main function of management. The decision making involves risk due to uncertainties. The capital Budgeting Decision is affected by numbers of factors such as future price trend, sales volume, competition, cost of raw material & other inputs.



- **RISK & UNCERTAINTY**

  Risk is defined as the variability that is likely to occur in the future returns from investment.

  It is the variability in the actual returns from a project from its future return at the time of the initial capital budgeting decision.

Capital Budgeting Techniques

Traditional Technique (Non Discounting)	**Modern Technique (Discounting)**
1. Payback Period	1. Net Present Value
2. Average Rate of Return	2. Internal Rate of Return
	3.Profitability Index Method
	4. Discounted Payback Period

I. Traditional Techniques (Non Discounting)

1. Pay-Back Period Method : It is defined as the number of years required to recover original cost invested in a project. It has two conditions

- **When cash inflow is constant every year**

  PBP= Cash outflow/cash inflow (p.a.)

- **When cash inflow are not constant every year**

  Payback period= Complete years + Negative Cashflow

  Cash inflow in next years

2. Average Rate of Return Method - ARR means the average annual earning on the project. Under this method, profit after tax and depreciation is considered. The average rate of return can be calculated in the following two ways.

Accounting Rate of Return = Average Profit After Tax * 100
Average Investment

II. Modern Techniques (Discounting Techniques)

1. **Discounted Pay-Back Period Method -** In discounted pay- back period method, the cash inflows are discounted by applying the present value factors for different time periods. For this, discounted cash inflows are calculated by multiplying the P.V. factors into cash inflows.

   Discounting Payback period= Complete years + Negative Cashflow
   Cash inflow in next years

2. **NET PRESENT VALUE METHOD =** It is the best method used for evaluation of Investment Proposal. This method takes into Account Time Value of method.

   Net Present Value = Present Value Of Cash Inflow – Present Value Of Cash Outflow

   EVALUATION OF NET PRESENT VALUE METHOD: Project with the higher NPV should be selected.
   ACCEPT IF NPV > 0
   REJECT IF NPV < 0

   MAY OR MAY NOT REJECT NPV=0

3. **. Profitability Index Method** - As the NPV method it is also shows that project is accepted or not. If Profitability index is higher than 1, the proposal can be accepted.

   Profitability Index Method = Present Value Of Cash Inflow
   Present Value Of Cash Outflow

   ACCEPTED PI>1
   REJECTED PI<1

4. **Internal Rate of Return Method:-** IRR is the rate of return that a project earns. The rate of discount calculated by trial and error , where the present value of future cash flows is equal to the present value of outflows, is known as the Internal Rate of Return.

$$\text{INTERNAL RATE OF RETURN} = HR + \frac{NPV1^*}{NPV1-NPV2}(HR-LR)$$

CAPITAL RATIONING

Meaning:

It is a process of allocating limited funds amongst the financially viable projects which are not mutually exclusive projects under consideration with a view to maximise the wealth of the shareholders. Thus, capital Rationing is done when:

1. limited funds are available for Investments.
2. More than one Financially viable projects which are not mutually exclusive are under consideration.

Classification of Projects:

- Divisible Projects- These are certain projects which can be taken in full or taken in partial.
- Indivisible Projects- These are certain proposals which may be indivisible . Such proposals may be taken in full or not taken at all.

Questions – Capital Budgeting

Q1. Mimosa co ltd. Has invested in a machine at a cost of Rs 9,00,000. Following details are estimated

Retrenchment in staff	4 staff @salary of Rs 20,000
Additional staff required	1 staff @salary of Rs 40,000
Saving in wastages	Rs 40,000
Savings in maintenance	Rs 10,000
Additional electricity bill	Rs 15,000

Calculate payback period. Ignore taxation and depreciation.

Q2. Calculate payback period from the following information of safer ltd.

Investment Rs. 1 lakh

Estimated life 10years.

Tax rates 50%

Year	**Profit before depn(Rs)**	**Depn (Rs)**	**Profit after depn(Rs)**	**Tax @ 50%**
1	40,000	10,000	30,000	15,000
2	60,000	10,000	50,000	25,000
3	50,000	10,000	40,000	20,000
4	50,000	10,000	40,000	20,000

Q3. If the net cash outlay of an investment project is Rs. 30,000and the annual cash inflow of 5years are Rs 9,000 , Rs 12,000 ,Rs 8000 ,Rs4000 ,Rs 5000 respectively. Calculate the payback period for victor ltd.

Q4. Excel trading co ltd is considering the purchase of new machine for the immediate expansion programme. There are 3 types of machines in the market for this purpose. Their details are as follows.

particulars	**Machine A**	**Machine B**	**Machine C**
Cost of machine	17,500	12,500	9,000
Estimated savings in scrap per year	400	750	250
Estimated savings indirect wages per year	2,750	6,000	2,250
Additional cost of indirect material per year	-	400	-
Expected savings in indirect material per year	100	-	250
Additional cost of maintenance per year	750	550	500
Additional cost of supervision	-	800	-
Estimated life of machine	10	6	5

You are required to advise the management which type of machine should be purchased on the basis of payback period?

Q5. Jugnu co ltd is proposing to expand its production. It can go for a standard machine costing Rs 50,000 or an assembled machine costing Rs 50,000. The life of both these machine is 5 years. The annual sales and costs are as below:

ParticulaRs	Standard (Rs)	Assembled (Rs)
Sales	50,000	50,000
Materials	15,000	15,000
Labour	7,000	6,000
Variable overheads	7,000	6,000

Compute the comparative profitability of the proposals under the payback period. Also calculate the payback profitability. Ignore taxation and depreciation.

Q6. Alpha ltd is producing articles mostly on hand labour and is considering to replace it by a new machine. There are 2 alternative models P and Q of the new machine. Prepare a statement of profitability showing the payback period from the following information:

Particulars	Machine P	Machine Q
Life of machine	4 years	5 years
	RS.	RS
Cost of machine	9,000	18,000
Estimated savings in scrap	500	800
Estimated savings in direct wages	6,000	8,000
Additional cost of maintenance	800	1,000
Additional cost of supervision	1,200	1,800

Ignore taxation and depreciation. Also calculate payback profitability.

Q7. From the following details of omega ltd calculate payback period and payback profitability.

Particulars	Rs.
Sales	8,000
Variable cost	3,000
Fixed cost(excluding depreciation)	2,000
Investment	10,000

Life 10 years. Tax @ 50%.

Q8. Charlie co ltd wishes to buy a machine costing Rs 2,00,000. The life if this machine is 10years and its scrap value would be Rs 5,000.

The following details are provided

Average annual NPBT	Rs. 20,000
Tax rate	35%
Depreciation(already charged)	SLM basis

Calculate:

1. Payback period
2. Payback profitability
3. ARR (accounting rate of return)

Q9. The directors of delta India ltd are considering the purchase if machine to replace a purchase of machine which has been in operation for last five years. The details relating to the available alternative machines are as follows.

Particulars	Old machine	New machine
Purchase price	2,00,000	3,00,000
Power per year	10,000	22,500
Consumable stores per year	30,000	37,500
Other charges per year	40,000	45,000
Wages per running hour	15	26.25
Selling price per unit	6.25	6.25
Material cost per unit	2.50	2.50
Estimated life of machine	10years	10 years
Machine running hours per year	2,000 hrs	2,000 hRs

Unit of output per year	24 units	36 units

Tax at 40% of net profit.

Assuming that above sales and cost of sales hold the good for entire economic life of the machine, suggest which of the 2 alternatives should be preferred. Using average rate of return. Depreciation has to be charged according to straight line method.

Q10. Determine the (a) payback period (b) A.R.R. from the following information of proposed project.

Particulars	Rs.
Cost	5,20,000
Annual profits after tax and depreciation	
Year1	30,000
2	50,000
3	70,000
4	90,000
5	1,10,000 total 3,50,000

Estimated life 5 years

Estimated scrap value Rs. 20,000

Q11. A plant is offered for Rs 1,00,000. Its estimated life is 20 years. During that period it is estimated that net cash flow of the plant will be at the rate of 10,000 p.a. and the rate of interest to be taken is 8%. Is it worthwhile to accept the offer?

Q12. A company is considering a project with an initial outlay of Rs. 60,000 comprising of machinery worth Rs50,000 and balance towards working capital exclusively for this project Rs 10,000. The entire amt can be borrowed at a rate of12% p.a. The machinery can be used for 5 years at the end of which there is no salvage value. It can be assumed that machinery is depreciated on SLM basis for tax purpose, the tax rate being 30%.

Evaluate whether the project is viable under NPV method. Also calculate the payback period for the project given the following annual sales and expenses.

Annual sales (Rs) 100,000

Expenses excluding depreciation(Rs) 30,000

Briefly note your reservation to the decision.

Q13. Gati co ltd is considering the following 3 investment proposals requiring a net cash outlay of Rs 1,20,000; Rs 1,70,000; Rs 2,40,000 respectively. The after cash inflows are tabulated below.

Rank these projects in order of profitability according to profitability index method. Assume that the cost of capital is 15%.

year	After tax cash inflow			Pv of ₹ 1 at 15% discounting factor
	Project x	Project y	Project z	
	Rs	Rs	Rs	
1	10,000	50,000	90,000	0.870
2	30,000	65,000	1,20,000	0.756
3	45,000	85,000	70,000	0.658
4	65,000	50,000	50,000	0.572
5	45,000	35,000	20,000	0.497

Q14. The cash flow streams for 2 alternative investments tata and bata are:

Year	Tata (Rs)	Bata(Rs)
0	(2,00,000)	(2,10,000)
1	50,000	80,000
2	80,000	60,000
3	1,00,000	80,000
4	80,000	60,000
5	60,000	80,000

Calculate the (1) payback period , (2) net present value using 11% discount rate and (3) benefit cost ratio using 11% discount rate for the 2 alternatives. Which would you choose? Why?

Q15. Speedage co ltd is considering a project which cost Rs 5,00,000. The estimated salvage value is 0. Tax rate is 55%. The company uses SLM depreciation and the proposed project has the cash inflow before depreciation and tax(CFBDT) as follows:

Year end	Cash inflows (Rs)
1	1,50,000
2	2,50,000
3	2,50,000
4	2,00,000
5	1,50,000

If the cost of capital is 12% , would you recommend the acceptance of the project under internal rate of return method?

Q16. Chingari ltd is currently under examination of a project which yield the following returns over a period of time:

Year end	Gross yield (Rs)
1	8,000
2	8,000
3	9,000
4	9,000
5	7,500

The cost of machinery to be installed works out of Rs 20,000 and the machine is to be depreciated at 20% on WDV basis. Income tax rate is 50%. If the average cost of raising capital is 18%, would you recommend accepting the project under IRR method.

Q17. Calculate the IRR for the following projects and decide which is the most profitable project.

ParticulaRs	Cash inflows(CFAT)		
	Project X (Rs)	Project Y (Rs)	Project Z(Rs)
Initial cost	6,00,000	6,60,000	7,20,000
End of year			
1	30,000	3,60,000	1,20,000
2	1,20,000	2,40,000	1,80,000
3	1,80,000	-	1,20,000
4	2,40,000	-	3,00,000
5	3,00,000	1,80,000	1,20,000
6	(60,000)	1,20,000	60,000
Total	8,10,000	9,00,000	9,00,000

Q18. A company is considering 2 mutually exclusive projects. The finance director consideRs that the project with higher NPV should be chosen; where as the managing director thinks that 1 with higher rate of return should be considered. Both the projects have got an useful life of 5 years and the cost of capital is 10%. The initial outlay is Rs 2,00,000.

The future cash inflow from project x and y are as under

year	Project X	Project Y	Pv factor @10%	Pv factor @ 20%
1	35,000	1,18,000	0.91	0.83
2	80,000	60,000	0.83	0.69
3	90,000	40,000	0.75	0.58
4	75,000	14,000	0.68	0.48
5	20,000	13,000	0.62	0.41

You are required to evaluate the projects and explain the inconsistency, if any in ranking of the project.

Q19. A company can make either of two investment at period. Assuming a required rate of return 10%, determine for each project:

1. The payback period
2. The discounted payback period
3. The profitability index
4. The internal rate of return

You may assume straight line depreciation.

	P	Q
Cost of investment(Rs)	2,00,000	
Expected life (no salvage value)	5years	
Projected net income(after depn,int and taxes)		
Year 1	10,000	24,000
2	10,000	24,000
3	20,000	24,000
4	20,000	24,000
5	20,000	24,000

Q20. Carvan corporation is venturing a new project. Initial investment for the project is Rs 20lakhs. The rate of depn 25% on WDV basis. The rate of discount is 10%, tax rate is 40%. Calculate:

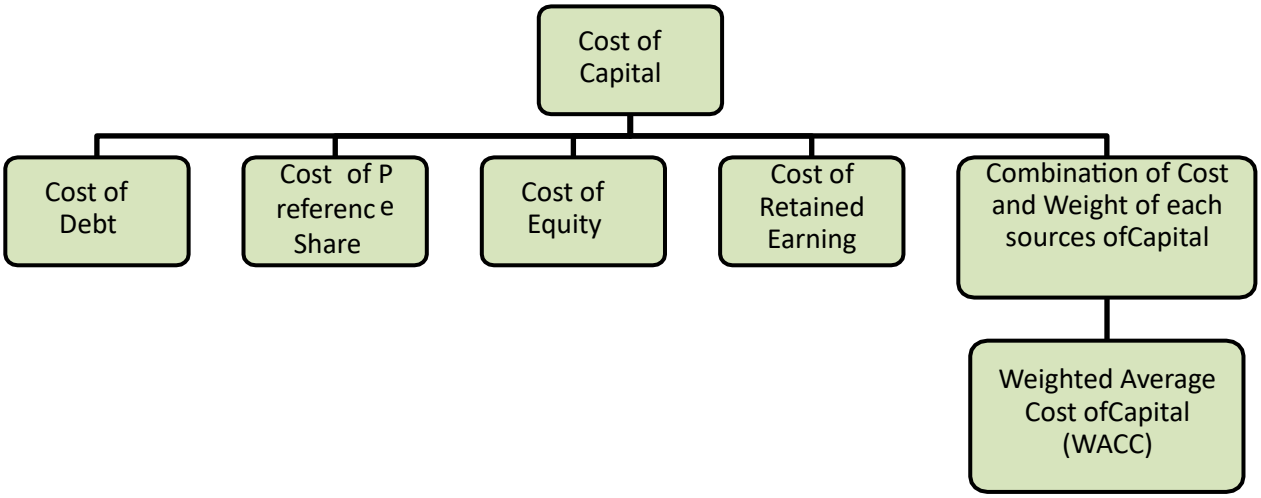
1. ARR
2. Discounted payback period
3. Discounted payback profitability

Year	2005	2006	2007	2008	2009
Earning before tax(Rs in lakhs)	2	5	7	9	2

COST OF CAPITAL

Cost of capital is the return expected by the providers of capital (i.e. shareholders, lenders and the debt-holders) to the business as a compensation for their contributionto the total capital. When an entity (corporate or others) procured finances from eithersources as listed above, it has to pay some additional amount of money besides the principal amount. The additional money paid to these financiers may be either one offpayment or regular payment at specified intervals. This additional money paid is said to be the cost of using the capital and it is called the cost of capital. This cost of capitalexpressed in rate is used to discount/ compound the cashflow or stream of cashflows.Cost of capital is also known as 'cut-off' rate, 'hurdle rate', 'minimum rate of return' etc.It is used as a benchmark for:

- Framing debt policy of a firm.
- Taking Capital budgeting decisions.



- **Formulas for computation of Cost of Capital:**

I. Short Term Debt:

a. Before Tax:

$K_d = I$

b. After Tax:

$K_d = I (1-t)$

Where,

K_d = Cost of Debt

I = Interest

t= Tax Rate

II. Long Term Irredeemable Debt:

a. Before Tax:

$$K_d = \frac{I}{NP} * 100$$

b. After Tax:

$$K_d = \frac{I}{NP} * 100 * (1-t)$$

Where,

K_d = Cost of Debt

I = Interest

NP = Net Proceeds
t= Tax Rate

III. Redeemable Debt / Debenture :

a. **Before Tax**:

$$K_d = \left[\frac{I + \left(\frac{FV - NP}{N} \right)}{\left(\frac{FV + NP}{2} \right)} \right] * 100$$

b. After Tax:

$$K_d = (1-t) \left[\frac{I + \left(\frac{FV - NP}{N} \right)}{\left(\frac{FV + NP}{2} \right)} \right] * 100$$

Where,
K_d = Cost of Debt
I = Interest
NP = Net Proceeds
t= Tax Rate
FV= Face Value
N= No. of Years

IV. Irredeemable Preference Shares:

a. Before Tax:

$$Kp = \left[\frac{PD}{NP} * 100 \right] \frac{* 1}{(1-t)}$$

b. After Tax:

$$Kp = \left[\frac{PD}{NP} * 100 \right]$$

Where,
K_p = Cost of Preference Capital
PD = Preference Dividend Amount
NP = Net Proceeds
t= Tax Rate

V. Redeemable Preference Shares:

a. Before Tax:

$$K_d = \left[\frac{PD + \left(\frac{FV - NP}{N} \right)}{\left(\frac{FV + NP}{2} \right)} * 100 \right] \frac{1}{(1-t)}$$

b. After Tax:

$$K_d = \left[\frac{PD + \left(\frac{FV - NP}{N} \right)}{\left(\frac{FV + NP}{2} \right)} \right] * 100$$

Where,

K_p = Cost of Preference Capital
PD = Preference Dividend Amount
NP = Net Proceeds
FV = Face Value
t= Tax Rate

VI. Equity Shares:

$$Ke = \left[\frac{\text{EPS or DPS}}{\text{MPS or NP}} * 100 \right] + G$$

Where,
EPS = Earning Per Share
DPS= Dividend Per Share
MPS = Market Price Per Share
NP = Net Proceeds
G = Growth Rate

VII. Retained Earnings:

$$Kr = \left[\left(\frac{D}{P} * 100 \right) + G \right] (1-t_{sh}) (1-B)$$

$Kr = Ke (1-t_{sh}) (1-B)$
Where ,
Kr= Cost of Retained Earning
D= DPS
P = MPS
G = Growth Rate in expected Dividends
T_{sh} = Shareholders Personal Tax Rate
B = Brokerage Cost

VIII. Market Value Approach : (Ke, Kp, Kd & not for Kr)

$$K\_ \text{ (After Tax)} = \frac{\text{Actual Returns paid on Face Value}}{\text{Total Market Value of Securities}} * 100 * (1-t)$$

Note: (1-t) is only for Debt.

IX. Net Proceeds:

	Face Value	XX
Add:	Premium	XX
Less:	Flotation Cost	XX
	Net Proceeds	**XX**

Note: 1.Returns are paid on Face Value.
2.Premium & Flotation Cost is on Face Value.

Questions : Cost of Capital

Q1. Following is the capital structure of Xcel Ltd. :

Sources	Amount ₹	Proportion %	Cost %
Debt	15,00,000	25	5
Preference shares	12,00,000	20	10
Equity shares	18,00,000	30	12
Retained earnings	15,00,000	25	11
	60,00,000	100	

Calculate Weighted Average Cost of Capital.

Q2. S Ltd. Has the following capital structure :

		(₹ in lacs)
Equity	2,00,000 shares	40.00
6% Preference	1,00,000 shares	10.00
8% Debentures	3,00,000 shares	30.00
		80.00

It proposes to borrow ₹ 20.00 lacs with interest at 10% p.a. The dividend on equity will increase from ₹2 to ₹3 per share. You are required to ascertain the change in the weighted average cost of capital consequent to proposed borrowings.

Q3. A company has its on its books the following amounts and specific costs of each type of capital:

Type of Capital	B.V. ₹	M.V. ₹	Specific Cost %
Debt	4,00,000	3,80,000	5
Preference	1,00,000	1,10,000	8
Equity	6,00,000	12,00,000	13
Retained earnings	2,00,000	-	9
	13,00,000	16,90,000	

Determine the Weighted Average Cost of Capital using:

i. B.V. Weights
ii. Market Value Weights.

Q4. Three companies A,B and C are in the same type of business and hence have a similar operating risks. However, the capital structure of each of them is different and the following are the details:

	A	B	C
Equity Share Capital (Face Value ₹10 per share)	4,00,000	2,50,000	5,00,000
Market Value per Share	15	20	12
Dividend per Share	2.70	4	2.88
Debentures (Face Value per debenture ₹100)	NIL	1,00,000	2,50,000
Market Value per Debenture	-	125	80
Interest Rate	-	10%	8%

Assume that the current levels of dividends are generally expected to continue indefinitely and the income-tax rate at 50%

You are required to compute weighted average cost of capital of each company.

Q5. The following information has been extracted from the balance sheet of fashion Ltd. As on 31st March,2009:

	₹ (in lakhs)
Equity	400
12% Debentures	400
Term Loan(Interest 18%)	1,200
	2000

i. Determine the weighted average cost of capital of the company. It had been paying dividends at a consistent rate of 20% p.a.
ii. What difference will it make if the current price of the ₹ 100 share is ₹ 160?
iii. Determine the effect of Income-tax on the cost of capital under both premises.

Q6. A Ltd. Share is quoted in the market at ₹ 20 currently. The company paid a dividend of ₹ 2 per share and the investor expect a growth rate of 5% per year.
Compute:

i. The company's equity cost of capital.
ii. If the anticipated growth rate is 8%. what would be the indicated market price of the share?

B Ltd has the following capital structure:

	₹
Equity shares	60 lakhs
12% Preference Shares	10 lakhs
14% Debentures	30 lakhs
Total	100 lakhs

The market price of the company's share is ₹ 20. it is expected that the company will pay next year a dividend of ₹ 2 per share which will grow at 8% for ever. Assume 40% tax rate.

You are required to:

a. Compute weighted average cost of capital based on existing capital structure.
b. Compute the new weighted average cost of capital if the company raises an additional ₹ 20 lakhs debt by issuing 15% debentures.

This would result in increasing the expected dividend to ₹ 3 per share and leave the growth rate unchanged but the price of the share will fall to ₹ 16.

Q7. From the following capital structure of a Ltd. , company you are required to calculate over all cost of capital using :

a. Book value weights.
b. Market value weights.

Source	Book Value ₹	Market Value ₹
Equity Share Capital (10/- shares)	45,000	90,000
Retained Earnings	15,000	-
Preference Share Capital	10,000	10,000
Debentures	30,000	30,000

The after tax cost of different sources is as follows:

Equity Share Capital	14%
Retained Earnings	13%
Preference Share Capital	10%
Debenture	5%

Q8. Three companies A, B and C are in the same type of business and hence have same operating risks. However, the capital structure of each of them is different and following are the details:

	A	B	C
Equity Share Capital (Face value ₹ 10)	4,00,000	2,50,000	5,00,000
Marker Value per share	15	20	12
Dividend per share	2.70	4	2.88
Debentures (Face Value ₹ 100)	NIL	1,00,000	2,50,000
Market Value per Debentures	-	125	80
Interest rate	-	10%	8%

Assume that the current levels of dividend are generally expected to continue indefinitely and tax rate is 50%.

Q9. The capital structure of H Ltd. as on 31st December, 2008 is as follows:

Equity Capital: 10 lakhs shares of 10 each = ₹ 1 crore

Reserves = ₹ 20 lakhs

14% Debentures of ₹ 100 each = ₹ 30 lakhs

For the year ended 31st December, 2008; the company has paid equity dividend at 20%. As the company is a market leader with good future, dividend is likely to grow by 5% every year. The equity shares are now traded at 80 per share in the stock exchange. Income tax rate applicable to the company is 40%.

You are required to calculate:

i. The current weighted average cost of capital.
ii. The company has plans to raise a further 50 lakhs by way of long-term loan at 15% interest. When this takes place, the market value of the equity shares is expected to fall to 50 per share. What will be the new weighted average cost of capital of the company?

Q10. A' Ltd. has following capital structure as on 31st December, 2008:

	₹
10% Debentures	6,00,000
9% Preference Shares	4,00,000
5000 Equity Shares of ₹ 100 each	5,00,000
Total	15,00,000

The Equity Shares of the Company are quoted at 100 and the Company is expected to declare a dividend of ₹ 9 per share for 2008. The company has registered a dividend growth rate of 5% which is expected to be maintained. The tax rate applicable to the company is 40%.

Calculate :

i. The weighted average cost of capital
ii. The revised weighted average cost of capital, if the company raises additional term loan of *5,00,000 at 12% for expansion. In such a situation the company can increase the dividend from 9 to 10 per share but the market price of the share would go down to ₹90.

Q11. The capital structure of Alpha Co. Ltd., comprising 12% debentures, 9% preference shares and equity shares of ₹ 100 each, is in the ratio of 3:2:5.
The company is contemplating introduction of further capital to meet the expansion needs by seeking 14% term loan from financial institution. As a result of this proposal, the proportion of debentures, preference shares and equity shares would get reduced by 1/10, 1/15 and 1/6, respectively. In the light of above proposal calculate the impact on weighted average cost of capital, assuming 35% tax rate expected dividend ₹ 9 per

share at the end of the year, the growth rate of equity dividend at 5%. No change in the dividend, dividend growth rate and market price of share is expected after availing the proposed term loan.

Q12. Following Information has been extracted from the books of Unique Fashioners Ltd. :

	₹
Equity Capital	4,00,00,000
12% Debentures	4,00,00,000
18% Term Loan	12,00,00,000
Total	20,00,00,000

The company has been paying 20% dividend per annum constantly. Compute average cost of capital if the current market price of a share of ₹ 100 is ₹ 160.

Q13. The following is the capital structure of Simons Company Ltd. As on 31-3-2018 :

	₹
Equity Share: 10,000 shares (of ₹ 100 each)	10,00,000
10% Preference Shares (of ₹ 100 each)	4,00,000
12% Debentures	6,00,000
	20,00,000

The market price of the company's share is ₹ 110 and it is expected that a dividend of ₹ 10 per share would be declared for the year 2018. The dividend growth rate is 6%.

i. If the company is in the 50% tax bracket, compute the weighted average cost of capital.
ii. Assuming that in order to finance an expansion plan, the company intends to borrow a fund of ₹ 10 lakh bearing 14% rate of interest, what will be the company's revised weighted average cost of capital?
iii. This financing decision is expected to increase dividend from ₹ 10 to ₹ 12 per share. However, the market price of equity share is expected to decline from₹ 110 to ₹ 105 per share.

Q14. A firm has the following structure and after tax cost of different sources of funds:

Sources of Funds	Amounts ₹	Proportion %	After Tax Cost %
Debts	15,00,000	25	5
Preference Share Capital	12,00,000	20	10
Equity Share Capital	18,00,000	30	12
Retained Earnings	15,00,000	25	11
	60,00,000	100	

Calculate Weighted Average Cost of Capital.

Q15. Ambuja Cements Ltd. Has the following capital structure:

	Market Value ₹	Book Value ₹	Cost %
Equity Share Capital	80	120	18
Preference Share Capital	30	20	15
Fully Secured Debentures	40	40	14

Calculate Weighted Average Cost of Capital.

LEVERAGES

Leverage is a practice which can help a business drive up its gains or losses. In business language, if a firm has fixed expenses in P/L accountor debt in capital structure , the firm is said to be levered. Nowadays, almost no business is away from it but very few have struck a balance.

According to **J. C. Van Home:** "Leverage is the employment of an assetor funds for which the firm pays a fixed cost of fixed return."

In finance, leverage is very closely related to fixed expenses. We can safely state that by the introduction of expenses which are fixed in nature, we are leveraging a firm. By fixed expenses, we refer to the expenses, the amount of which remains unchanged irrespective of the activity of the business. For example, an amount of investment made infixed assets or interest paid on loans does not change with a normal change in a number of sales. Neither they decrease with a decrease in sales and nor they increase with an increase in sales.

Types of Leverage

There is a different basis for classifying business expenses. For our convenience, let us classify fixed expenses into operating fixed expensessuch as depreciation on fixed expenses, salaries etc., and financial fixed expenses such as interest and dividend on preference shares. Similar to them, leverages are also of two types – financial and operating.

1. **Operating Leverage**
2. **Financial Leverage**
3. **Combined Leverage**

I. Financial Leverage (FL)

It is a leverage created with the help of debt component in the capital structure of a company. Higher the debt, higher would be the FL becausewith higher debt comes the higher amount of interest that needs to be paid. It can be both bad and good for a business depending on the situation. If a firm is able to generate a higher return on investment (ROI) than the interest rate it is paying, leverage will have its positive effect shareholder's return. The darker side is that if the said situation is opposite, higher leverage can take a business to a worst situation like bankruptcy.

a. **When there is no preference Dividend ,**
   Financial Leverage = $\frac{\text{EBIT}}{\text{EBT}}$
b. **When there is preference Dividend ,**
   Financial Leverage = $\frac{\text{EBIT}}{\text{EBT- Preference Dividend}}$

c. **Degree of Financial Leverage = $\frac{\text{\% change in EPS}}{\text{\% change in EBIT}}$**

II. Operating Leverage (OL)

Just like the financial, it is a result of operating fixed expenses. Higher the fixed expense, higher is the OL. Like the FL had an impact on the shareholder's return or say earnings per share, OL directly impacts the operating profits (Profits before Interest and Taxes (PBIT)). Under goodeconomic conditions, an increase of 1% in sales will have more than 1%change in operating profits.

So, you need to be very careful in adding any of the leverages to your business viz. financial or operating as it can also work as a double-edgedsword.

a. **Operating Leverage = Contribution / EBIT**

b. **Degree of Operating Leverage = % change in EBIT / % change in Sales**

III. Combined Leverage (CL)

Combined leverage is a leverage which refers to high profits due to fixed costs. It includes fixed operating expenses with fixed financial expenses. It indicates leverage benefits and risks which are in fixed quantity. Competitive firms choose high level of degree of combined leverage whereas conservative firms choose lower level of degree of combined leverage. Degree of combined leverage indicates benefits and risks involved in this particular leverage.

a. **Combined Leverage = Financial Leverage * Operating Leverage**

b. **Combined Leverage = Contribution / EBT**

c. **Degree of Combined Leverage = % change in EPS / % change in sales**

Worksheet:

Particulars	**₹**
Sales	XX
Less: Variable Cost	(X)
Contribution	XX
Less: Fixed Cost	(X)
Earning Before Interest & Tax	XX
Less: Interest	(X)
Earning Before Tax	XX
Less: Tax	(X)
Earning After Tax	XX
Less: Preference Dividend	(X)
Earning For Equity Shareholder	XX
No. Of Equity Shares	X
Earning Per Shares	X

Questions- Leverages

1) Y Ltd. Has sales of ₹ 2,00,000. Variable cost is 50% of sales while the fixed operating cost amounts to ₹ 60,000. Interest on long-term loan amounted to ₹ 20,000.

You are requested to calculate the composite leverage.

2) The following information is available in respect of two firms, P Ltd. And Q Ltd. :

	P Ltd. ₹	Q Ltd. ₹
Sales	500	1000
- Variable Cost	200	300
Contribution	300	700
- Fixed Cost	150	400
EBIT	150	300
-Interest	50	100
Profit before Tax	100	200

You are requires to calculate different leverages for both the firms and also comment on their relative risk position.

3) A simplified Income Statement of Zenith Ltd. Is given below. Calculate its degree of operating leverage, degree of financial leverage and degree of combined leverage.

Zenith Ltd. - Income Statement

For the year ending 31st March, 2003

	₹
Sales	10,50,000
Variable Cost	7,67,000
Fixed Cost	75,000
EBIT	2,08,000
Interest	1,10,000
Taxes(30%)	29,400
Net Income	68,600

4) A] Find out Operating Leverage from the following data :

Sales ₹ 50,000

Variable Costs 60%

Fixed Costs ₹ 12,000

B] Find out the Financial Leverage from the following data :

Net Worth ₹ 25,00,000

Debt/Equity 3:1

Interest Rate 12%

Operating Profit ₹ 20,00,000

5) From the following information available for 4 firms, calculate the Earnings Before Interest and Tax(EBIT), Earnings per Share{EPS}, the Operating Leverage and the Financial Leverage:

Firms

	Rita	**Mita**	**Rishi**	**Miti**
Sales(in Units)	20,000	25,000	30,000	40,000
Selling Price per Unit(₹)	15	20	25	30
Variable Cost per Unit(₹)	10	15	20	25
Fixed Costs (₹)	30,000	40,000	50,000	60,000
Interest(₹)	15,000	25,000	35,000	40,000
Tax%	40	40	40	40
Number of Equity Shares	5,000	9,000	10,000	12,000

6) A firm has Sales of ₹ 75,00,000; Variable Cost ₹ 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.

What are the Operating, Financial and Combined leverage of the firm?

7) The selected financial data for A,B and C companies for the year ended 31st March, 2002 were as follows :

	A	B	C
Variable Cost as a Percentage of Sales	$66\ ^{2}/_{3}$	75	50
Interest Expenses (₹)	200	300	1,000
Degree of Operating Leverage	5	6	2
Degree of Financial Leverage	3	4	2
Income Tax Rate%	40	40	40

Prepare the Income Statement for each of the three companies.

8) Calculate operating leverage, financial leverage and combined leverage from the following data under situation I and situation II and financial plan A and B.

Particulars	Amount ₹
Installed capacity	4000 units
Actual production ans sales	75% of the capacity
Selling price	₹ 30 per unit
Variable cost	₹ 15 per unit
Fixed cost :	
Situation I	₹ 15,000
Situation II	₹ 20,000

Particulars	Financial Plan A	Financial Plan B
Equity	10,000	15,000
Debentures (rate of interest at 20%)	10,000	5,000
	20,000	20,000

9) Following is the data provided about XYZ Ltd. :

Particulars	Amount ₹
Unit Sold	1,00,000
Selling price per unit	4
Variable cost per unit	1.40
Fixed cost	1,50,000
interest	60,000

A) Calculate the degree of :

i. Operating Leverage
ii. Financial Leverage

B) Calculate Combined Leverage

C) What would be the effect on these leverages if the sales are increased by 10%? Write your comment.

10) Given below are Income Statement of three firms P,Q and R :

Particulars	P (₹)	Q (₹)	R (₹)
Sales revenue	9,00,000	18,75,000	2,50,000
Less : Variable expenses	3,00,000	5,62,500	50,000
Contribution	6,00,000	13,12,500	2,00,000
Less : Non-variable expenses	3,50,000	7,00,000	75000
EBIT	2,50,000	6,12,500	1,25,000
Less : Interest	25,000	40,000	-
EBT	2,25,000	5,72,500	1,25,000
Less : Tax @40%	90,000	2,29,000	50,000
PAT	1,35,000	3,43,500	75,000
Less : Dividend :			
On preference shares	37,500	43,500	25,000
On equity shares	75,000	2,00,000	15,000
Addition to retained earnings	22,500	1,00,000	35,000

Calculate the degrees of operating leverages, financial leverages and combined leverage for these firms and interpret the result.

11) The following are the operating results os a firm :

Sales (units)	25,000
Interest per annum	₹ 30,000
Selling price per unit	₹ 24
Tax rate	50%
Variable cost per unit	₹ 16
No. Of equity shares	10,000
Fixed costs per annum	₹ 80,000

Compute :

i. Break even sales
ii. Earnings before interest and tax
iii. Earnings per share
iv. Operating Leverage
v. Financial Leverage.

12) The following figures are available for success & co.

Net sales ₹15 crores

EBIT as percentage of net sales 12%

Capital employed- (a) Equity ₹ 5 crores, (b) Preference shares of ₹1 crore bearing 13% rate of dividend, (c) Debt @ 15% ₹ 3 crores.

The applicable Income-tax to be taken as 40%.

You are required to calculate - i)Return on equity of the company

i) operating leverage of the company.
Given that its combined leverage is 3.

13) From the following information, calculate the percentage of change in earning per share, if the sales are decreased by 5%.

Earnings before interest and tax (EBIT) ₹1,120 lakhs

Profit before tax (PBT) ₹ 320 lakhs

Fixed cost ₹ 700 lakhs

14) The data relating to to companies are as given below :

Particulars	Company A	Company B
Equity Capital	₹ 6,00,000	₹ 3,50,000
12% Debentures	₹ 4,00,000	₹ 6,50,000
Output (units) p.a.	60,000	15,000
Selling price/unit	₹ 30	₹ 250
Fixed cost p.a.	₹ 7,00,000	₹ 14,00,000
Variable cost p.u.	₹ 10	₹ 75

You are required to calculate the operating leverage, financial leverage and combined leverage of two companies.

15) The share capital of a company is ₹ 10,00,000 with shares of face value of ₹ 10. The company has debt capital of ₹ 6,00,000 at 10% rate of interest. The sales of the firm are 3,00,000 units per annum at a selling price of ₹ 5 per unit and the variable cost is ₹ 3 per unit. The fixed cost amounts to ₹ 2,00,000. The company pays tax at 35%. It the sales increase by 10%

Calculate: i)Percentage increase in EPS

ii) Degree of operating leverage at the two levels, and

iii) Degree of financial leverage at the two levels.

16) Calculate operating leverage, financial leverage and combined leverage under situation 1 and 2 in financial plans A & B from the following information relating to the operation and capital structure of a company.

Installed capacity- 2,000 units

Actual production and sales- 50% of the capacity

Selling price ₹ 20 per unit

Variable cost ₹ 10 per unit

Fixed cost:

Under Situation I ₹ 4,000

Under Situation II ₹ 5,000

Capital Structure:

Financial

	A (₹)	B (₹)
Equity	5,000	15,000
Debt (Rate of Interest 10%)	15,000	5,000
	20,000	20,000

17) The following key information pertains to Ashika Ltd. For the year 2013-14.

	₹ (in lakhs)
Sales	82.50
Variable cost	46.20
Fixed cost	6.60
9% Debentures	50.00
Equity Shares(₹ 100 each)	60
Corporate Tax	35%

You are required to work out :

i. What is the Company's ROI?
ii. Does it have favourable financial leverage?
iii. If thefirm belongs to an industry whose asset turnover is 3, does it have high or low asset leverage?
iv. What is the operating, financial and combined leverage of the firm?
v. What is the Company's EPS?
vi. What will be the expected EPS if the sales of Ashika Ltd. Increase by 10% in the next year and cost structure as well as financial structure remains same?

18) The selected financial data for A, B and C companies for the year ended 31st March, 2014 were as follows :

	A	B	C
Variable cost as a Percentage of Sales	$66\frac{2}{3}$	75	50
Interest Expenses (₹)	200	300	1,000
Degree of Operating Leverage	5	6	6
Degree of Financial Leverage	3	4	2
Income Tax Rate	35%	35%	35%

Prepare an income statement for each of the companies.

19) From the following prepare Income Statement of company A and B.

	A Co.	B Co.
Financial Leverage	4:1	5:1
Interest	₹ 6,00,000	₹ 7,00,000
Operating Leverage	3:1	4:1
Variable cost to sales	66%	50%
Income tax rate	30%	40%
No. Of Equity Shares	1,00,000	70,000

Also Calculate and comments on EPS of the company.