

CAPITAL BUDGETING-PART 2

CEC APPROACH

QUESTION NO.6 (8 Marks) Airborne Ltd. wants to take advantage of a new government scheme of connecting smaller towns and wants to purchase one-turboprop airplane at a cost of Rs5 crores. It has obtained permission to fly on 4 sectors.

The company had provided the following estimates of its costs and revenues. The cost of capital is 16% and the company depreciates its assets over a period of 25 years on a straight-line basis. Currently it is operating in a 30% tax regime and under the new government scheme it enjoys a 100% tax waiver for the first 3 years.

- Passenger Capacity of the aircraft: 60 passengers
- Expected Operational Capacity: 80%
- Per aircraft no. of trips on a daily basis: 4

	<u>Amount in (Rs)</u>
Average realization per passenger	2,000
Annual Cost of Manpower	250,00,000
Airport handling charges - Fixed per day	10,000
Annual Repairs and Maintenance	50,00,000
Daily Operating Costs	75,000

The costs with the exception of Airport handling charges are expected to increase 10% year on year and the Operational Capacity would go up to 90% from Year 3.

The certainty of achieving the projected cash flows in the first five years are 0.8, 0.9, 0.75, 0.7 and 0.7 and PV at 16% are 0.862, 0.743, 0.641, 0.552, 0.476 respectively. Advise the management on the feasibility of the project, assuming the aircraft operates on all the 365 days in a year.

Solution:

Working Notes:

(i) Depreciation = Rs 5,00,00,000 / 25 = Rs 20,00,000 Per Annum

(ii) Realization from Passenger

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
Passenger Capacity	60	60	60	60	60
Exp. Operational Capacity	80%	80%	90%	90%	90%
No. of Trips per Day	4	4	4	4	4
Average Realization Per Passenger (Rs)	2,000	2,000	2,000	2,000	2,000
No. of Days	365	365	365	365	365
Realizations (Rs)	14,01,60,000	14,01,60,000	15,76,80,000	15,76,80,000	15,76,80,000

(iii) Statement Showing Cost

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
Annual Cost of Manpower	2,50,00,000	2,75,00,000	3,02,50,000	3,32,75,000	3,66,02,500
Airport Handling Charges	36,50,000	36,50,000	36,50,000	36,50,000	36,50,000
Annual Repair & Maintenance Operating Exp.	5,00,00,000	5,50,00,000	6,05,00,000	6,65,50,000	7,32,05,000
Total	<u>2,73,75,000</u>	<u>3,01,12,500</u>	<u>3,31,23,750</u>	<u>3,64,36,125</u>	<u>4,00,79,738</u>
	<u>10,60,25,000</u>	<u>11,62,62,500</u>	<u>12,75,23,750</u>	<u>13,99,11,125</u>	<u>15,35,37,238</u>

(iv) Statement Showing NPV

	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>
Realizations	14,01,60,000	14,01,60,000	15,76,80,000	15,76,80,000	15,76,80,000
Cost of Operations	10,60,25,000	11,62,62,500	12,75,23,750	13,99,11,125	15,35,37,238
Depreciation	<u>20,00,000</u>	<u>20,00,000</u>	<u>20,00,000</u>	<u>20,00,000</u>	<u>20,00,000</u>
Profit Before Tax	3,21,35,000	2,18,97,500	2,81,56,250	1,57,68,875	21,42,762
Less: Tax*	----	-	-	47,30,663	6,42,829

Profit after Tax	3,21,35,000	2,18,97,500	2,81,56,250	1,10,38,212	14,99,933
Add: Depreciation	<u>20,00,000</u>	<u>20,00,000</u>	<u>20,00,000</u>	<u>20,00,000</u>	<u>20,00,000</u>
	3,41,35,000	2,38,97,500	3,01,56,250	1,30,38,212	34,99,933
CE Factor	0.8	0.9	0.75	0.70	0.70
Certain Cash Flow	2,73,08,000	2,15,07,750	2,26,17,188	91,26,748	24,49,953
PVF@16%	<u>0.862</u>	<u>0.743</u>	<u>0.641</u>	<u>0.552</u>	<u>0.476</u>
PV of Cash Inflow	<u>2,35,39,496</u>	<u>1,59,80,258</u>	<u>1,44,97,618</u>	<u>50,37,965</u>	<u>11,66,178</u>
	Total PV of Cash Inflow		6,02,21,515		
	PV of Cash Outflow		<u>5,00,00,000</u>		
	NPV		<u>1,02,21,515</u>		

Decision: Since NPV is positive Airborne Ltd. should accept the project.

Note: Question clearly stated that no tax will apply in first 3 years.

CAPITAL BUDGETING-PART 1

CALCULATION OF BREAKEVEN PERIOD

QUESTION NO.14 (6 Marks) Sea Rock Ltd. has an excess cash of Rs30,00,000 which it wants to invest in short-term marketable securities.

(i) Expenses resulting to investment will be Rs45,000. The securities invested will have an annual yield of 10%. The company seeks your advice as to the period of investment so as to earn a pre-tax income of 6%.

(ii) Also find the minimum period for the company to break-even its investment expenditure. Ignore time value of money

Note: Breakeven means No Profit Loss situation.

Solution:

(i) Period of investment: Let the period of Investment be P and return required on investment Rs 1,80,000 (Rs 30,00,000 x 6%) ; Accordingly, (Rs 30,00,000 x (10 / 100) x P / 12) - Rs 45,000 = Rs 1,80,000 or P = 9 months

(ii) Break-Even its investment expenditure : (Rs 30,00,000 x (10 / 100) x P/12) - Rs 45,000 = 0 or P = 1.80 months

CAPITAL BUDGETING-PART 2

QUESTION NO.6 (8 Marks) Indian Newsprint Ltd. (INL) a leading manufacturer of newsprint in the country, is planning to start manufacturing card board unit. Planning & Strategy division of the company has placed before the board of directors the "Dental Project Report" of the card board unit. The report inter alia, includes the following cash flow: **(Fig. in Rs lakhs)**

<u>Year</u>	<u>Cost of the plant</u>	<u>Recurring cost</u>	<u>Savings</u>
0	1000		
1		400	1200
2		500	1400

The cost of the capital is 9%.

You are required to measure the sensitivity of the project to changes in the levels of plant value, recurring cost and savings (considering each factor at a time) such that the NPV becomes zero. The present value factor at 9% are given below:

<u>Year</u>	<u>PVF 9%</u>
0	1
1	0.917
2	0.842

Advise the board of directors which factor is the most sensitive to affect the acceptability of the project?

Solution:

PV of Cash Flows			<u>Rs Lacs</u>
Year 1	Running Cost	400×0.917	= (366.80)
	Savings	$1,200 \times 0.917$	= 1100.40
Year 2	Running Cost	500×0.842	= (421.00)
	Savings	$1,400 \times 0.842$	<u>= 1178.80</u>
			1491.40
Year 0	Less: P.V. of Cash Outflow	$1,000 \times 1$	<u>1,000.00</u>
	NPV		<u>491.40</u>

Sensitivity Analysis: Taking Adverse %**(i) If the initial project cost is varied adversely by say 10%*.**

NPV (Revised) = (Rs 491.40 lacs - Rs 100.00 lacs) = Rs 391.40 lacs

% Change in NPV = $(491.40 - 391.40) / 491.40 = 20.35\%$

(ii) If Annual Running Cost is varied by say 10%*.

NPV (Revised) = (Rs 491.40 - Rs 40 X 0.917 - Rs 50 X 0.843)
= Rs 491.40 lacs - Rs 36.68 lacs - Rs 42.15 lacs = Rs 412.57 lacs

% Change in NPV = $(491.40 - 412.60) / 491.40 = 16.04\%$

(iii) If Saving is varied by say 10%*.

NPV (Revised) = (Rs 491.40 lacs - Rs 120 lacs X 0.917 - Rs 140 lacs X 0.843)
= Rs 491.40 lacs - Rs 110.04 lacs - Rs 118.02 lacs = Rs 263.34 lacs

% Change in NPV = $(491.40 - 263.34) / 491.40 = 46.41\%$

Decision: Hence, savings factor is the most sensitive to affect the acceptability of the project.

* Any percentage of variation other than 10% can also be assumed by candidates.

Sensitivity Analysis: Taking NPV = 0

(i) Increase of Plant Value by Rs 491.40 lacs : $(491.40 / 1000) \times 100 = 49.14\%$

(ii) Increase of Running Cost by Rs 491.40 lacs : $491.40 / (366.80 + 421) = (491.40 / 787.70) \times 100 = 62.38\%$

Proof: (not required for exam)

NPV = $-[400 + 62.38\% \text{ of Rs. } 400] \times .917 + 1200 \times .917 - [500 + 62.38\% \text{ of } 500] \times .842 + 1400 \times .842 - 1000 = 0$

(iii) Fall in Saving by Rs 491.40 lacs : $491.40 / (1100.40 + 1178.80) = (491.40 / 2279.20) \times 100 = 21.56\%$

Decision: Hence, savings factor is the most sensitive to affect the acceptability of the project as in comparison of other two factors as a slight % change in this factor will give more affect the NPV than others.

Note: Any one alternative can be used in exam

CAPITAL BUDGETING-PART 1

QUESTION NO.1 (5 Marks) SS Company is considering the replacement of its existing machine with a new machine. The Purchase price of the New machine is Rs 26 Lakhs and its expected Life is 8 years. The company follows straight-line method of depreciation on the original investment (scrap value is not considered for the purpose of depreciation). The other expenses to be incurred for the New Machine are as under:

(i) Installation Charges Rs 9,000

(ii) Fees paid to the consultant for his advice to buy New Machine Rs 6,000.

(iii) Additional Working Capital required Rs 17,000. (will be released after 8 years)

The written down value of the existing machine is Rs 76,000, and its Cash Salvage Value is Rs 12,500. The dismantling of this machine would cost Rs 4,500. The Annual Earnings (before tax but after depreciation) from the New Machine would amount to Rs 3,15,000. Income tax rate is 35%. The Company's required Rate of Return is 13%. You are required to advise on the viability of the proposal.

PVIF (13%, 8) = 0.376

PVIFA (13%, 8) = 4.80

Solution: (a) Working Notes:**1. Computation of Annual Depreciation-**

<u>Particulars</u>	<u>Rs</u>
Purchase Price	26,00,000
Add: 1. Installation Charges	9,000
2. Fees Paid to Consultant for Advice	<u>6,000</u>
Total Cost of New Machine	26,15,000
Useful Life	8 Years
Annual Depreciation (Total Cost/No. of Years)	3,26,875

2. Computation of Annual Cash Savings-

<u>Particulars</u>	<u>Rs</u>
Annual Earnings	3,15,000
Less-Tax @35%	<u>1,10,250</u>
Earning after Tax	2,04,750
Add-Depreciation on New Machine Annual Cash Savings	<u>3,26,875</u>
	<u>5,31,625</u>

3. Tax effect on sale of Old Machine-

<u>Particulars</u>	<u>Rs</u>
Proceeds of Sale	12,500
Less: Cost of Removal	<u>4,500</u>
Net Proceeds	8,000
Less: WDV	<u>76,000</u>
Net Loss due to Sale	68,000
Tax savings due to Loss on Sale @35%	<u>23,800</u>
Total Cash Inflow due to Sale (Rs 8,000+Rs 23,800)	31,800

4. Computation of Net Present Value

<u>Particulars</u>	<u>Period</u>	<u>Cash Flow</u> <u>(Rs)</u>	<u>PVF</u> <u>@13%</u>	<u>PV</u> <u>(Rs)</u>
(a) Annual Cash inflow after Tax	1-8	5,31,625	4.8	25,51,800
(b) Net Salvage Value of Existing Machine	0	31,800	1.0	31,800
(c) Working Capital Realized	8	17,000	0.376	<u>6,392</u>
Present Value of Cash Inflows				25,89,992
Less: 1. Initial Investment	0	26,15,000	1.0	26,15,000
2. Initial Working Capital	<u>0</u>	<u>17,000</u>	<u>1.0</u>	<u>17,000</u>
NPV of the Proposal				<u>(42,008)</u>

Decision: Since NPV of the project is negative it is not viable.

DIVIDEND

QUESTION NO.10 (8 Marks) CBZ limited belongs to a risk class for which the approved capitalization rate is 10%. It currently has outstanding 6,000 shares selling at Rs100/- each. The firm is planning for declaration of dividend of Rs. 6/- per share at the end of the current financial year. The company expects to have a net income of Rs 60,000/- and has a proposal to make new investments of Rs1,50,000/-. As under the M-M hypothesis the payment of dividend doesnot affect the value of the firm, calculate price of share at the end of financial year, no. of shares to be issued and value of firm separately in the following situations :

(i) When dividends are paid and (ii) When dividends are not paid.

Solution: (A) When dividend is paid

(a) **Price per share at the end of year 1 :** $100 = 6 + P_1/(1+.10)$ or $P_1 = 104$

(b) **Amount required to be raised from issue of new shares:** Rs 1,50,000 - (Rs 60,000 - Rs 36,000) = Rs 1,26,000

(c) Number of additional shares to be issued : $1,26,000 / 104 = 1,211.54$ shares or say 1,212 shares

(d) Value of CBZ Ltd.

At The Beginning:

$$n P_o = \frac{(n+m)P_1 + E_1 - I_1}{(1+Ke)^1} = \frac{(6,000 + 1212) \times 104 + 60000 - 1,50,000}{(1+.10)^1} = \text{Rs.}6,00,000$$

At The End: (Number of shares x Expected Price per share) i. e., $(6,000 + 1,212) \times \text{Rs } 104 = \text{Rs } 750048$

B. When dividend is not paid

(a) Price per share at the end of year 1 : $100 = P_1 / 100$ or $P_1 = 110$

(b) Amount required to be raised from issue of new shares: $\text{Rs } 1,50,000 - \text{Rs } 60,000 - \text{Rs } 90,000$

(c) Number of additional shares to be issued : $= 90,000 / 110 = 818.18$ shares or say 818 shares.

(d) Value of CBZ Ltd.:

At The Beginning:

$$n P_o = \frac{(n+m)P_1 + E_1 - I_1}{(1+Ke)^1} = \frac{(6,000 + 818) \times 110 + 60000 - 1,50,000}{(1+.10)^1} = \text{Rs.}6,00,000$$

At The End: $(6,000 + 818) \times \text{Rs } 110 = \text{Rs } 7,49,980^*$

Conclusion: Thus, as per M.M. approach the value of firm in both situations will be the same.

*There is minor difference in answer due to approximation.

CAPITAL BUDGETING-PART 2

QUESTION NO.2 (5 Marks) KLM Ltd., is considering taking up one of the two projects-**Project-K and Project-S.** both the projects having same life require equal investment of Rs 80 lakhs each. Both are estimated to have almost the same yield. As the company is new to this type of business, the cash flow arising from the projects cannot be estimated with certainty. An attempt was therefore, made to use probability to analyse the pattern of cash flow from other projects during the first year of operations. This pattern is likely to continue during the life of these projects. The results of the analysis are as follows:

<u>Project K</u>		<u>Project S</u>	
<u>Cash Flow (in Rs)</u>	<u>Probability</u>	<u>Cash Flow (in Rs)</u>	<u>Probability</u>
11	0.10	09	0.10
13	0.20	13	0.25
15	0.40	17	0.30
17	0.20	21	0.25
19	0.10	25	0.10

Required:(i) Calculate variance, standard deviation and co-efficient of variance for both the projects.?

(ii) Which of the two projects is more risky?

Solution:

Project K : Expected Net Cash Flow:

$$= (0.1 \times 11) + (0.20 \times 13) + (0.40 \times 15) + (0.20 \times 17) + (0.10 \times 19) = 1.1 + 2.6 + 6 + 3.4 + 1.9 = 15$$

$$\text{Standard Deviation: } \sigma^2 = 0.10 (11-15)^2 + 0.20 (13-15)^2 + 0.40 (15-15)^2 + 0.20 (17-15)^2 + 0.10$$

$$(19-15)^2 = 1.6 + 0.8 + 0 + 0.8 + 1.6 = 4.8 \text{ or } \sigma = \sqrt{4.8} = 2.19$$

Project S : Expected Net Cash Flow

$$= (0.10 \times 9) + (0.25 \times 13) + (0.30 \times 17) + (0.25 \times 21) + (0.10 \times 25) = 0.9 + 3.25 + 5.1 + 5.25 + 2.5 = 17$$

$$\text{Standard Deviation: } \sigma^2 = 0.1 (9-17)^2 + 0.25 (13-17)^2 + 0.30 (17-17)^2 + 0.25 (21-17)^2 + 0.10 (25-17)^2$$

$$= 6.4 + 4 + 0 + 4 + 6.4 = 20.8 \text{ CT=V } 20.8 = 4.56$$

Calculation of Coefficient of Variation: Coefficient of Variation = [Standard Deviation / Mean]

Project K = $2.19 / 15 = 0.146$; Project S = $4.56 / 17 = 0.268$

(ii) Decision: Project S is riskier as it has higher Coefficient of Variation.

MANAGEMENT OF RECEIVABLES (DEBTORS)

DIFFERENT CUSTOMERS OFFERED DIFFERENT DISCOUNT PERIOD

Question No.6 Tony Limited, manufacturer of Colour TV sets is considering the liberalization of existing credit terms to three of their large customers A, B and C. The credit period and likely quantity of TV sets that will be sold to the customers in addition to other sales are as follows: **Quantity sold (No. of TV Sets)**

<u>Credit Period (Days)</u>	<u>A</u>	<u>B</u>	<u>C</u>
0	1,000	1,000	-
30	1,000	1,500	-
60	1,000	2,000	1,000
90	1,000	2,500	1,500

The selling price per TV set is Rs 9,000. The expected contribution is 20% of the selling price. The cost of carrying receivable averages 20% per annum. **You are required:** (a) COMPUTE the credit period to be allowed to each customer. (Assume 360 days in a year for calculation purposes). (b) DEMONSTRATE the other problems the company might face in allowing the credit period as determined in (a) above?

Solution:

(a) In case of customer A, there is no increase in sales even if the credit is given. Hence comparative statement for B & C is given below:

<u>Particulars</u>	<u>Customer B</u>				<u>Customer C</u>			
	0	30	60	90	0	30	60	90
1. Credit period (days)	0	30	60	90	0	30	60	90
2. Sales Units	1,000	1,500	2,000	2,500	-	-	1,000	1,500
	Rs in lakhs				Rs in lakhs			
3. Sales Value	90	135	180	225	-	-	90	135
4. Contribution at 20% (A)	18	27	36	45	-	-	18	27
5. Receivables:								
[Credit Period * Sales]/ 360	-	11.25	30	56.25	-	-	15	33.75
6. Debtors at cost i.e.	-	9	24	45	-	-	12	27
80% of 11.25								
7. Cost of carrying debtors at 20% (B)	-	1.8	4.8	9	-	-	2.4	5.4
8. Excess of contributions over cost of carrying debtors (A - B)	18	25.2	31.2	36			15.6	21.6

The excess of contribution over cost of carrying Debtors is highest in case of credit period of 90 days in respect of both the customers B and C. Hence, credit period of 90 days should be allowed to B and C.

(b) Problem:

(i) Customer A is taking 1000 TV sets whether credit is given or not. Customer C is taking 1000 TV sets at credit for 60 days. Hence A also may demand credit for 60 days compulsorily.

(ii) B will take 2500 TV sets at credit for 90 days whereas C would lift 1500 sets only. In such case B will demand further relaxation in credit period i.e. B may ask for 120 days credit. [Hint: Any other point of view can also be given with appropriate reason]

DIVIDEND DECISIONS

Question No.10 The earnings per share of a company is Rs10 and the rate of capitalisation applicable to it is 10 per cent. The company has three options of paying dividend i.e. (i) 50%, (ii) 75% and (iii) 100%.

Total Value of Company	<u>32,00,000</u>	<u>20,00,000</u>
------------------------	------------------	------------------

(ii) Valuation of Companies under Net Operating Income Approach

Value of Unlevered Firm = $EBIT(1-tax)/K_o = 6,00,000 (1-.50)/15\% = 20,00,000$

Value of levered Firm = Value of Unlevered Firm + Debenture x Tax Rate = $20,00,000 + 18,00,000 \times 50\% = 29,00,000$

WORKING CAPITAL REQUIREMENT

QUESTION NO.5 (10 Marks) Day Ltd., **a newly formed company** has applied to the Private Bank for the **first time** for financing it's Working Capital Requirements. The following informations are available about the projections for the current year:

Estimated Level of Activity **Completed Units of Production 31200 plus unit of work in progress 12000**

Raw Material Cost	Rs40 per unit
Direct Wages Cost	Rs 15 per unit
Overhead	Rs40 per unit (inclusive of Depreciation 10 per unit)
Selling Price	Rs 130 per unit
Raw Material in Stock	Average 30 days consumption
Work in Progress Stock	Material 100% and Conversion Cost 50%
Finished Goods Stock	24000 Units
Credit Allowed by the supplier	30 days
Credit Allowed to Purchasers	60 days
Direct Wages (Lag in payment)	15 days
Expected Cash Balance	Rs2,00,000

Assume that production is carried on evenly throughout the year (360 days) and wages and overheads accrue similarly. All sales are on the credit basis.

You are required to calculate: the Net Working Capital Requirement on Cash Cost Basis.

Solution:

Calculation of Net Working Capital requirement:

(Rs)

A. Current Assets:

Inventories:

Stock of Raw material (Refer to Working note (iii))	1,44,000
Stock of Work in progress (Refer to Working note (ii))	7,50,000
Stock of Finished goods (Refer to Working note (iv))	20,40,000
Debtors for Sales (Refer to Working note (v))	1,02,000
Cash	<u>2,00,000</u>
Gross Working Capital (A)	<u>32,36,000</u>

B. Current Liabilities:

Creditors for Purchases (Refer to Working note (vi))	1,56,000
Creditors for wages (Refer to Working note (vii))	<u>23,250</u>
Total Current Liability (Total A)	<u>1,79,250</u>
Net Working Capital (B)	<u>30,56,750</u>

Working Notes:

(i) Annual cost of production

(Rs)

Raw material requirements $\{(31,200 \times Rs\ 40) + (12,000 \times Rs\ 40)\}$	17,28,000
Direct wages $\{(31,200 \times Rs\ 15) + (12,000 \times Rs\ 15 \times 0.5)\}$	5,58,000
Overheads (exclusive of depreciation) $\{(31,200 \times Rs\ 30) + (12,000 \times Rs\ 30 \times 0.5)\}$	<u>11,16,000</u>
Gross Factory Cost	34,02,000
Less: Closing W.I.P [12,000 (Rs 40 + Rs 7.5 + Rs15)]	<u>(7,50,000)</u>
Cost of Goods Produced	26,52,000
Less: Closing Stock of Finished Goods (Rs 26,52,000 x 24,000/31,200)	<u>(20,40,000)</u>

Total Cash Cost of Sales	<u>6,12,000</u>
(ii) Work in progress stock	(Rs)
Raw material requirements (12,000 units x Rs40)	4,80,000
Direct wages (50% x 12,000 units x Rs 15)	90,000
Overheads (50% x 12,000 units x Rs 30)	<u>1,80,000</u>
	<u>7,50,000</u>

(iii) Raw material stock: It is given that raw material in stock is average 30 days consumption. Since, the company is newly formed; the raw material requirement for production and work in progress will be issued and consumed during the year. Hence, the raw material consumption for the year (360 days) is as follows:

For Finished goods (31,200 x Rs 40)	12,48,000
For Work in progress (12,000 x Rs 40)	<u>4,80,000</u>
	17,28,000
Raw material stock = (Rs17,28,000 / 360 days) x 30 days=	Rs1,44,000
(iv) Finished goods stock: 24,000 units @ Rs (40+15+30) per unit =	Rs20,40,000
(v) Debtors for sale: (Rs 6,12,000 / 360days) x 60days =	Rs 1,02,000
(vi) Creditors for raw material Purchases :	
Opening Stock	Nil
+Purchases during the year (bal.fig)	Rs18,72,000
-Closing Stock	<u>1,44,000</u>
Raw Material Consumed During the year	17,28,000
Credit allowed by suppliers = (Rs18 72 000 / 360 Days) x 30days=	Rs 1,56,000
(vii) Creditors for wages:	
Outstanding wage payment = (Rs 5,58,000 / 360days) x 15days=	Rs 23,250

CAPITAL BUDGETING-PART 1

TERMINAL CASH FLOW

Question No. 1. ABC Ltd. has an investment proposal with information as under:

	<u>Amount in Rs</u>
Existing Asset:	
Current Book-Value	6,00,000
Annual Revenue from this Asset	25,00,000
Annual Cash Outflow (expenses) on this Asset	18,00,000
Depreciation of this Assets per annum	1,50,000
New Asset to be purchased:	
Cost	27,00,000
Installation charges	3,00,000
Depreciation on 90% of Rs 30,00,000 as under for new asset:	
Year 1	8,00,000
Year 2	7,00,000
Year 3	6,00,000
Year 4	6,00,000
Annual Revenue from this Asset (for each of four years)	70,00,000
Annual Cash Outflow (expenses) on this Asset	28,00,000
Additional Workings Capital required	5,00,000
The Scrap (Salvage) value of this Asset at the end of Year 4	8,00,000

The company has Tax Rate for both Revenues and Capital Gain/Loss of 34%. You are required to find Net Annual Incremental Cash Flows. Also, show computation of Terminal Cash flow.

Note: Show calculation of amount to the nearest Rupee.

Solution:**Working note:****(i) (A) Annual Cash inflow from the Existing Asset: Rs**

Annual Revenue	25,00,000
Less: Annual Cash Outflow (expenses)	<u>18,00,000</u>
Gross Revenue	7,00,000
Less: Depreciation	<u>1,50,000</u>
Profit Before Tax (PBT)	5,50,000
Less Tax @ 34%	1,87,000
Add back depreciation	<u>1,50,000</u>
Annual Net Cash Inflow	<u>5,13,000</u>

(B)

Year	1	2	3	4
Particulars	Rs	Rs	Rs	Rs
New Assets:				
Annual Revenue	70,00,000	70,00,000	70,00,000	70,00,000
Less: Cash outflow	<u>28,00,000</u>	<u>28,00,000</u>	<u>28,00,000</u>	<u>28,00,000</u>
Profit before depreciation and tax	42,00,000	42,00,000	42,00,000	42,00,000
Less: Depreciation	<u>8,00,000</u>	<u>7,00,000</u>	<u>6,00,000</u>	<u>6,00,000</u>
Profit before tax (PBT)	34,00,000	35,00,000	36,00,000	36,00,000
Less: Tax 34%	<u>11,56,000</u>	<u>11,90,000</u>	<u>12,24,000</u>	<u>12,24,000</u>
Profit after Tax (PAT)	22,44,000	23,10,000	23,76,000	23,76,000
Add back depreciation	<u>8,00,000</u>	<u>7,00,000</u>	<u>6,00,000</u>	<u>6,00,000</u>
Annual Cash Inflow	30,44,000	30,10,000	29,76,000	29,76,000
Less: Cash Inflow from Existing Assets:	<u>5,13,000</u>	<u>5,13,000</u>	<u>5,13,000</u>	<u>5,13,000</u>
Annual New Incremental Cash Inflows	25,31,000	24,97,000	24,63,000	24,63,000

(ii) Computation of Terminal Cash Inflow:

Particulars	Rs
Salvage Value (as given)	8,00,000
Less: Book Value	<u>3,00,000</u> (10% of 30,00,000)
Gain on Sale	5,00,000
Tax Paid 34%	<u>1,70,000</u>
Salvage Value Adjusted For Tax = 8,00,000 - 1,70,000 =	6,30,000
Plus: Working Capital released	<u>5,00,000</u>
Sub-total	<u>11,30,000</u>

Note: Following Items is of no use for this question. Since question had also asked us to calculate Net Annual Incremental Cash Flows & computation of Terminal Cash flow. These items are : Current Book-Value 6,00,000 ; Cost 27,00,000 ; Installation charges 3,00,000 ; Additional Workings Capital required : 5,00,000

CAPITAL BUDGETING-PART 1**WHEN INVESTMENT IS DEFERRED**

Question No.2 Currently there exists an opportunity to invest Rs 1 lakh for manufacturing a product. The estimated demand, sale price and variable cost will be 6,000 units, Rs 10 per unit and Rs 6 per unit respectively. If investment is deferred by one year the estimated demand, sale price and variable cost will be 8,000 units, Rs 11 per unit and Rs 5 per unit respectively. After 2 years due to sluggish demand and import tariff on the raw material the estimated demand, sale price and variable cost will be 5,000 unit, Rs 9 per unit and Rs 7.50 per unit respectively. Assuming

Cost of Capital of Company as 10%, you are required to advise the best course of investment. (Amount to be shown to the nearest rupee).

Solution:

$$NPV_0 = [6000 \times (10-6)/0.10] - Rs\ 1,00,000 = Rs\ 1,40,000 ;$$

$$NPV_1 = \frac{8000 \times (11 - 5)/0.10 - 100000}{1.10} = 345454 ;$$

$$NPV_2 = \frac{5000 \times (9 - 7.5)/0.10 - 100000}{(1.10)^2} = 20,661$$

Decision: It is better to defer the investment by 1 year and not by 2 years

INDIFFERENT POINT

Question No.1 [4 Marks] RPS Company presently has Rs. 36,00,000 in debt outstanding bearing an interest rate of 10 per cent. It wishes to finance a Rs. 40,00,000 expansion programme and is considering three alternatives: additional debt at 12 per cent interest, preferred stock with an 11 per cent dividend, and the sale of common stock at Rs. 16 per share. The company presently has 8,00,000 shares of common stock outstanding and is in a 40 per cent tax bracket.

(i) If earnings before interest and taxes are presently Rs. 15,00,000, CALCULATE earnings per share for the three alternatives, assuming no immediate increase in profitability?

(ii) CALCULATE indifference point between debt and common stock.

Solution:

(i) Particulars	(Rs. in thousands)	Debt	Preferred Stock	Common Stock
EBIT		1,500	1,500	1,500
Interest on existing debt		360	360	360
Interest on new debt		480	-	-
Profit before taxes		660	1,140	1,140
T axes		264	456	456
Profit after taxes		396	684	684
Preferred stock dividend		-	440	-
Earnings available to common shareholders		396	244	684
Number of shares		800	800	1,050
Earnings per share		.495	.305	.651

(ii) Mathematically, the indifference point between debt and common stock is (Rs in thousands):

$$(EBIT - Rs. 840) / 800 = (EBIT - Rs. 360) / 1,050 \text{ or } EBIT(1,050) - Rs. 840(1,050) = EBIT(800) - Rs. 360(800)$$

$$250EBIT = Rs. 5,94,000 \text{ or } EBIT = Rs. 2,376$$

RATIO ANALYSIS

Question No.2 [4 Marks] MNP Limited has made plans for the year 2019 -20. It is estimated that the company will employ total assets of Rs.50,00,000; 30% of assets being financed by debt at an interest cost of 9% p.a. The direct costs for the year are estimated at Rs. 30,00,000 and all other operating expenses are estimated at Rs. 4,80,000. The sales revenue are estimated at Rs. 45,00,000. Tax rate is assumed to be 40%. CALCULATE: (i) Net profit margin (After tax); (ii) Return on Assets (After tax); (iii) Asset turnover; and (iv) Return on Equity.

Solution:

The net profit is calculated as follows:

	Rs.
Sales Revenue	45,00,000
Less: Direct Costs	30,00,000

Gross Profits	15,00,000
Less: Operating Expense	4,80,000
Earnings before Interest and tax (EBIT)	10,20,000
Less: Interest on debt (9% x 15,00,000)	1,35,000
Earnings before T ax) (EBT)	8,85,000
Less: Taxes (@ 40%)	3,54,000
Profit after T ax (PAT)	5,31,000

(i) Net Profit Margin (After Tax)

Net Profit Margin = [EBIT(1 - t) / Sales] x 100 = [Rs 10,20,000 x (1-0.4) / Rs 45,00,000] = 13.6 %

(ii) Return on Assets (ROA) (After tax)

= EBIT (1-t) / Total Assets

= [Rs.10,20,000(1-0.4) / Rs 50,00,000] = Rs.6,12,000 / Rs.50,00,000 = 0.1224 = 12.24 %

(iii) Asset Turnover

Asset Turnover = Sales / Assets = Rs. 45,00,000 / Rs.50,00,000 = 0.9 or Asset Turnover = 0.9 times

(iv) Return on Equity (ROE)

ROE = PAT / Equity = 5,31,000 / Rs 35,00,000 = 15.17% or ROE = 15.17%

Note: We can use any other return figures also as explained by sir in class.

CAPITAL STRUCTURE:MM With TAX

Question No.3 [4 Marks] A Ltd. and B Ltd. are identical in every respect except capital structure. A Ltd. does not employ debts in its capital structure whereas B Ltd. employs 12% Debentures amounting to Rs.100 lakhs. Assuming that :**(i)** All assumptions of M-M model are met;**(ii)** Income-tax rate is 30%;**(iii)** EBIT is Rs. 25,00,000 and **(iv)** The Equity capitalization rate of 'A' Ltd. is 20%.CALCULATE the value of both the companies and also find out the Weighted Average Cost of Capital for both the companies.

Solution:

(i)Calculation of Value of 'A Ltd.' and 'B Ltd' according to MM Hypothesis:

Market Value of 'A Ltd' (Unlevered) : $V_U = \frac{EBIT(1-t)}{K_e} = \frac{2500000(1-0.30)}{20\%} = 17,50,000 / 20\% = Rs\ 87,50,000$

Market Value of 'B Ltd.' (Levered) = $V_L = V_U + TB = Rs. 87,50,000 + (Rs.1,00,00,000 \times 0.30)$

= Rs. 87,50,000 + Rs.30,00,000 = Rs.1,17,50,000

(ii) Computation of Weighted Average Cost of Capital (WACC):

WACC of 'A Ltd.' = 20% (i.e. $K_e = K_o$)

<u>WACC of 'B Ltd.'</u>	<u>B Ltd. (Rs.)</u>
EBIT	25,00,000
Interest to Debt holders	(12,00,000)
EBT	13,00,000
T axes @ 30%	(3,90,000)
Income available to Equity Shareholders	9,10,000
T otal Value of Firm	1,17,50,000
Less: Market Value of Debt	(1,00,00,000)
Market Value of Equity	17,50,000
Return on equity (K_e) = 9,10,000 / 17,50,000	0.52

Computation of WACC B. Ltd

<u>Component of Capital</u>	<u>Amount</u>	<u>Weight</u>	<u>Cost of Capital</u>	<u>WACC</u>
Equity	17,50,000	0.149	0.52	0.0775
Debt	1,00,00,000	0.851	0.084*	0.0715
Total	1,17,50,000			0.1490

$$*K_d = 12\% (1 - 0.3) = 12\% \times 0.7 = 8.4\%$$

Therefore WACC = 14.90%

LEVERAGES

Question No.4 [3 Marks] B LLP. has the following balance sheet and Income statement information:

Balance Sheet as on March 31st 2019			
Liabilities	(Rs.)	Assets	(Rs.)
Partners' Capital	80,00,000	Net Fixed Assets	1,00,00,000
Term Loan	60,00,000	Inventories	45,00,000
Retained Earnings	35,00,000	Trade Receivables	40,50,000
Trade Payables	15,00,000	Cash & Bank	4,50,000
	<u>1,90,00,000</u>		<u>1,90,00,000</u>

Income Statement for the year ending March 31st 2019 (Rs.)	
Sales	34,00,000
Operating expenses (including Rs. 6,00,000 depreciation)	<u>12,00,000</u>
EBIT	22,00,000
Less: Interest	<u>6,00,000</u>
Earnings before tax	16,00,000
Less: Taxes	<u>5,60,000</u>
Net Earnings (EAT)	<u>10,40,000</u>

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

Solution:

Computation of Degree of Operating (DOL), Financial (DFL) and Combined leverages (DCL)

$$DOL = (Rs. 34,00,000 - Rs. 6,00,000) / Rs. 22,00,000 = 1.27$$

$$DFL = Rs. 22,00,000 / Rs. 16,00,000 = 1.38$$

$$DCL = DOL \times DFL = 1.27 \times 1.38 = 1.75$$

CAPITAL BUDGETING-PART 1

Question No.5 [7 Marks] H Ltd. is considering a new product line to supplement its range of products. It is anticipated that the new product line will involve cash investments of Rs. 70,00,000 at time 0 and Rs. 1,00,00,000 in year 1. After-tax cash inflows of Rs. 25,00,000 are expected in year 2, Rs. 30,00,000 in year 3, Rs. 35,00,000 in year 4 and Rs. 40,00,000 each year thereafter through year 10. Although the product line might be viable after year 10, the company prefers to be conservative and end all calculations at that time.

(i) If the required rate of return is 15 per cent, FIND OUT the net present value of the project? Is it acceptable?

(ii) COMPUTE NPV if the required rate of return were 10 per cent?

(iii) COMPUTE the internal rate of return?

Solution:

Year	Cash flow	Discount Factor (15%)	Present value
0	(70,00,000)	1.000	(70,00,000)
1	(1,00,00,000)	0.870	(87,00,000)
2	25,00,000	0.756	18,90,000
3	30,00,000	0.658	19,74,000
4	35,00,000	0.572	20,02,000
5-10	40,00,000	2.163	<u>86,52,000</u>
		Net Present Value	(11,82,000)

Decision: As the net present value is negative, the project is unacceptable.

(ii) Similarly, NPV at 10% discount rate can be computed as follows:

<u>Year</u>	<u>Cash flow</u>	<u>Discount Factor (10%)</u>	<u>Present value</u>
0	(70,00,000)	1.000	(70,00,000)
1	(1,00,00,000)	0.909	(90,90,000)
2	25,00,000	0.826	20,65,000
3	30,00,000	0.751	22,53,000
4	35,00,000	0.683	23,90,500
5-10	40,00,000	2.974	1,18,96,000
		Net Present Value	25,14,500

Decision: Since NPV = Rs.25,14,500 is positive, hence the project would be acceptable.

(iii) IRR = LR + [NPV at LR / NPV at LR - NPV at HR] x (HR - LR)

= 10% + [Rs.25,14,500 / (Rs.25,14,500 - (-)11,82,000)] x (15% - 10) = 10% + 3.4012 or 13.40%

RATIO ANALYSIS

Question No.1 The following is the Profit and loss account and Balance sheet of KLM LLP.

Trading and Profit & Loss Account

<u>Particulars</u>	<u>Amount (Rs)</u>	<u>Particulars</u>	<u>Amount (Rs)</u>
To Opening stock	12,46,000	By Sales	1,96,56,000
T o Purchases	1,56,20,000	By Closing stock	14,28,000
To Gross profit c/d	<u>42,18,000</u>		
	<u>2,10,84,000</u>		<u>2,10,84,000</u>
		By Gross profit b/d	42,18,000
To Administrative expenses	18,40,000	By Interest on investment	24,600
To Selling & distribution expenses	7,56,000	By Dividend received	22,000
T o Interest on loan	2,60,000		
To Net profit	<u>14,08,600</u>		
	<u>42,64,600</u>		<u>42,64,600</u>

Balance Sheet as on

<u>Capital & Liabilities</u>	<u>Amount (Rs)</u>	<u>Assets</u>	<u>Amount (Rs)</u>
Capital	20,00,000	Plant & machinery	24,00,000
Retained earnings	42,00,000	Building	42,00,000
General reserve	12,00,000	Furniture	12,00,000
Term loan from bank	26,00,000	Sundry receivables	13,50,000
Sundry Payables	7,20,000	Inventory	14,28,000
Other liabilities	<u>2,80,000</u>	Cash & Bank balance	<u>4,22,000</u>
	<u>1,10,00,000</u>		<u>1,10,00,000</u>

You are required to compute: (i) Gross profit ratio (ii) Net profit ratio (iii) Operating cost ratio (iv) Operating profit ratio (v) Inventory turnover ratio (vi) Current ratio (vii) Quick ratio (viii) Interest coverage ratio (ix) Return on capital employed (x) Debt to assets ratio.

Solution:

(i) Gross profit ratio = (Grossprofit / Sales) x100 = (Rs42,18,000 / Rs1,96,56,000) x100 = 21.46%

(ii) Net profit ratio = (Netprofit / Sales) x100 = (Rs14,08,600 / Rs1,96,56,000) x100 = 7.17%

(iii) Operating ratio = (Operating cost / Sales) x100

Operating cost = Cost of goods sold + Operating expenses

or Cost of goods sold = Sales - Gross profit or 1,96,56,000 - 42,18,000 = 1,54,38,000

Operating expenses = Administrative expenses + Selling & distribution expenses = 18,40,000 + 7,56,000 = 25,96,000

Operating Ratio = { (1,54,38,000 + 25,96,000) / Rs1,96,56,000 } x100 = (1,80,34,000 / 1,96,56,000) x100 = 91.75%

(iv) Operating profit ratio = 100 - Operating cost ratio = 100 - 91.75% = 8.25%

(v) Inventory turnover ratio = Cost of goods sold / Average stock
 $1,54,38,000 / (14,28,000 + 12,46,000)/2$ or $1,54,38,000 / 13,37,000 = 11.55$ times

(vi) Current ratio = Current assets / Current liabilities

Current assets = Sundry receivables + Inventory + Cash & Bank balance = $13,50,000 + 14,28,000 + 4,22,000 = 32,00,000$

Current liabilities = Sundry Payables + Other liabilities = $7,20,000 + 2,80,000 = 10,00,000$

Current ratio = $32,00,000 / 10,00,000 = 3.2$ times

(vii) Quick Ratio = (Current assets - Inventories) / Current liabilities = $(32,00,000 - 14,28,000) / 10,00,000 = 1.77$ times

(viii) Interest coverage ratio = EBIT / Interest = $(14,08,600 + 2,60,000) / 2,60,000 = 6.42$ times

(ix) Return on capital employed (ROCE) = (EBIT / Capital employed) x 100

Capital employed = Capital + Retained earnings + General reserve + Term loan

= $20,00,000 + 42,00,000 + 12,00,000 + 26,00,000 = 1,00,00,000$

Therefore, ROCE = $(16,68,600 / 1,00,00,000) \times 100 = 16.69\%$

(x) Debt to assets ratio = (Debts / Total Assets) x 100 = $(26,00,000 / 1,10,00,000) \times 100 = 23.64\%$

Note: Debt assumed to be Long Term Debt.

COST OF CAPITAL

Question No.2 KM Ltd. has the following capital structure on September 30, 2019:

<u>Sources of capital</u>	<u>(Rs)</u>
Equity Share Capital (40,00,000 Shares of Rs 10 each)	4,00,00,000
Reserves & Surplus	4,00,00,000
12% Preference Shares	2,00,00,000
9% Debentures	<u>6,00,00,000</u>
	<u>16,00,00,000</u>

The market price of equity share is Rs60. It is expected that the company will pay next year a dividend of Rs6 per share, which will grow at 10% forever. Assume 40% income tax rate.

You are required to: COMPUTE weighted average cost of capital using market value weights.

Solution:

(i) Cost of Equity (k_e) = $(D_1 / P_0) + g = Rs (6 / 60) + 0.10 = 0.20 = 20\%$

(ii) Cost of Debentures (k_d) = $I (1 - t) = 0.09 (1 - 0.4) = 0.054$ or 5.4%

Computation of Weighted Average Cost of Capital (WACC using market value weights)

<u>Source of capital</u>	<u>Market Value of capital (Rs)</u>	<u>Weight</u>	<u>Cost of capital (%)</u>	<u>WACC (%)</u>
9% Debentures	6,00,00,000	0.1875	5.40	1.01
12% Pref. Shares	2,00,00,000	0.0625	12.00	0.75
Eq. Share Capital	<u>24,00,00,000</u>	<u>0.7500</u>	20.00	<u>15.00</u>
Total	<u>32,00,00,000</u>	<u>1.00</u>		<u>16.76%</u>

CAPITAL STRUCTURE

Question No.3 The management of RT Ltd. wants to raise its funds from market to meet out the financial demands of its long-term projects. The company has various combinations of proposals to raise its funds. You are given the following proposals of the company:

<u>Proposal</u>	<u>Equity shares (%)</u>	<u>Debts (%)</u>	<u>Preference shares (%)</u>
P	100	-	-
Q	50	50	-
R	50	-	50

(i) Cost of debt and preference shares is 12% each.

(ii) Tax rate -40%

(iii) Equity shares of the face value of Rs10 each will be issued at a premium of Rs10 per share.

(iv) Total investment to be raised Rs8,00,00,000.

(v) Expected earnings before interest and tax Rs3,60,00,000.

From the above proposals the management wants to take advice from you for appropriate plan after computing the following: • Earnings per share • Financial break-even-point

Compute: The EBIT range among the plans for indifference.

Solution:

(i) Computation of Earnings per Share (EPS)

Plans	P (Rs)	Q (Rs)	R (Rs)
Earnings before interest & tax (EBIT)	3,60,00,000	3,60,00,000	3,60,00,000
Less: Interest charges	--	(48,00,000)	--
Earnings before tax (EBT)	3,60,00,000	3,12,00,000	3,60,00,000
Less : T ax @ 40%	(1,44,00,000)	(1,24,80,000)	(1,44,00,000)
Earnings after tax (EAT)	2,16,00,000	1,87,20,000	2,16,00,000
Less: Preference share dividend	--	--	(48,00,000)
Earnings available for equity shareholders	2,16,00,000	1,87,20,000	1,68,00,000
No. of equity shares	40,00,000	20,00,000	20,00,000
E.P.S	5.40	9.36	8.40

(ii) Computation of Financial Break-even Points

Proposal P = 0

Proposal Q = Rs48,00,000 (Interest charges)

Proposal R = Earnings required for payment of preference share dividend i. e. Rs48,00,000/ (1-.40) = Rs80,00,000

(iii) Computation of Indifference Point between the Proposals

Combination of Proposals

(a) Indifference point where EBIT of proposal P and proposal Q is equal :

$EBIT(1-0.4) / 40,000 \text{ shares} = [(EBIT-Rs48,00,000)(1-0.4)] / 20,000 \text{ shares}$

0.6 EBIT = 1.2 EBIT - Rs57,60,000 or EBIT = Rs96,00,000

(b) Indifference point where EBIT of proposal P and proposal R is equal:

$EBIT(1-0.40) / 40,000 \text{ shares} = [EBIT(1-0.40) -Rs48,00,000] / 20,000 \text{ shares}$

0.30 EBIT = 0.6 EBIT - Rs48,00,000 OR EBIT = Rs48,00,000 / 0.30 =Rs1,60,00,000

(c) Indifference point where EBIT of proposal Q and proposal R are equal:

$[(EBIT-Rs48,00,000)(1-0.4)] / 20,000 \text{ shares} = [EBIT(1-0.4)-Rs48,00,000] / 20,000 \text{ shares}$

Decision: There is no indifference point between proposal Q and proposal R

RATIO ANALYSIS

REASONING BASED QUESTION

Question No.1. From the following table of financial ratios of R Textiles Limited, comment on various ratios given at the end:

Ratios	2017	2018	Average of Textile Industry
Liquidity Ratios			
Current ratio	2.2	2.5	2.5
Quick ratio	1.5	2	1.5
Receivable turnover ratio	6	6	6
Inventory turnover	9	10	6
Receivables collection period	87 days	86 days	85 days
Operating profitability			
Operating income -ROI	25%	22%	15%
Operating profit margin	19%	19%	10%

Financing decisions

Debt ratio	49.00%	48.00%	57%
------------	--------	--------	-----

Return

Return on equity	24%	25%	15%
------------------	-----	-----	-----

Comment on the following aspect of R Textiles Limited:

(i) Liquidity **(ii)** Operating profits **(iii)** Financing **(iv)** Return to the shareholders Cost of Capital

Solution:**Ratios****Comment****Liquidity**

Current ratio has improved from last year and matching the industry average. Quick ratio also improved than last year and above the industry average. This may happen due to reduction in receivable collection period and quick inventory turnover. However, this also indicates idleness of funds.

Overall it is reasonably good. All the liquidity ratios are either better or same in both the year compare to the Industry Average.

Operating Profits

Operating Income-ROI reduced from last year but Operating Profit Margin has been maintained. This may happen due to variability of cost on turnover. However, both the ratio are still higher than the industry average.

Financing

The company has reduced its debt capital by 1% and saved operating profit for equity shareholders. It also signifies that dependency on debt compared to other industry players (57%) is low.

Return to the of shareholders

R's ROE is 24 per cent in 2017 and 25 per cent in 2018 compared to an industry average 15 per cent. The ROE is stable and improved over the last year.

COST OF CAPITAL

Question No.2 As a financial analyst of a large electronics company, you are required to DETERMINE the weighted average cost of capital of the company using **(a)** book value weights and **(b)** market value weights. The following information is available for your perusal. The Company's present book value capital structure is: **(Rs)**

Debentures (Rs 100 per debenture)	8,00,000
Preference shares (Rs 100 per share)	2,00,000
Equity shares (Rs 10 per share)	<u>10,00,000</u>
	<u>20,00,000</u>

All these securities are traded in the capital markets. Recent prices are:

Debentures, Rs 110 per debenture, Preference shares, Rs 120 per share, and Equity shares, Rs 22 per share

Anticipated external financing opportunities are:

(i) Rs 100 per debenture redeemable at par; 10 year maturity, 11 per cent coupon rate, 4 per cent flotation costs, sale price, Rs 100

(ii) Rs 100 preference share redeemable at par; 10 year maturity, 12 per cent dividend rate, 5 per cent flotation costs, sale price, Rs 100.

(iii) Rs Equity shares: Rs 2 per share flotation costs, sale price = Rs 22.

In addition, the dividend expected on the equity share at the end of the year is Rs 2 per share, the anticipated growth rate in dividends is 7 per cent and the firm has the practice of paying all its earnings in the form of dividends. The corporate tax rate is 35 per cent.

Solution:**Determination of specific costs:**

$$(i) \text{ Cost Debt } (k_d) = \frac{\text{Interest}(1-t) + \left(\frac{RV - NP}{N}\right)}{\left(\frac{RV + NP}{2}\right)} = \frac{Rs11(1-0.35) + \left(\frac{Rs100 - Rs96}{10\text{years}}\right)}{\left(\frac{Rs100 + Rs96}{2}\right)} = Rs(7.15 + 0.4) / Rs 98 = 7.7\%$$

$$(ii) \text{ Cost of Preference shares } (K_p) = \frac{PD + \left(\frac{RV - NP}{N}\right)}{\left(\frac{RV + NP}{2}\right)} = \frac{Rs12 + \left(\frac{Rs100 - Rs95}{10\text{years}}\right)}{\left(\frac{Rs100 + Rs95}{2}\right)} = Rs(12 + 0.5) / Rs 97.5 = 12.82\%$$

$$(iii) \text{ Cost of Equity shares } (K_e) = \frac{D_1}{P_0} + G = [Rs 2 / (Rs 22 - Rs 2)] + 0.07 = 17\%$$

Using these specific costs we can calculate WACC on the basis of book value and market value weights as follows:

(a) Weighted Average Cost of Capital (K0) based on Book value weights:

<u>Source of capital</u>	<u>Book value</u>	<u>Weights</u>	<u>Specific cost (%)</u>	<u>WACC (%)</u>
Debentures	8,00,000	0.40	7.70	3.08
Preferences shares	2,00,000	0.10	12.82	1.28
Equity shares	<u>10,00,000</u>	<u>0.50</u>	<u>17.00</u>	<u>8.50</u>
	<u>20,00,000</u>	<u>1.00</u>		<u>12.86</u>

(b) Weighted Average Cost of Capital (K0) based on market value weights:

<u>Source of capital</u>	<u>Market value (Rs)</u>	<u>Weights</u>	<u>Specific cost (%)</u>	<u>WACC(%)</u>
Debentures				
$\left(\frac{Rs8,00,000}{100}\right)Rs110$	8,80,000	0.265	7.70	2.04
Preferences share				
$\left(\frac{Rs2,00,000}{100}\right)Rs120$	2,40,000	0.072	12.82	0.92
Equity shares				
$\left(\frac{Rs10,00,000}{10}\right)Rs22$	<u>22,00,000</u>	<u>0.663</u>	<u>17.00</u>	<u>11.27</u>
	<u>33,20,000</u>	<u>1.000</u>		<u>14.23</u>

MANAGEMENT OF WORKING CAPITAL

Question No.7A proforma cost sheet of a company provides the following particulars:

	<u>Amount per unit (Rs)</u>
Raw materials cost	100.00
Direct labour cost	37.50
Overheads cost	<u>75.00</u>
Total cost	212.50
Profit	<u>37.50</u>
Selling Price	250.00

The Company keeps raw material in stock, on an average for one month; work-in-progress, on an average for one

week; and finished goods in stock, on an average for two weeks. The credit allowed by suppliers is three weeks and company allows four weeks credit to its debtors. The lag in payment of wages is one week and lag in payment of overhead expenses is two weeks.

The Company sells one-fifth of the output against cash and maintains cash-in-hand and at bank put together at Rs 37,500. **Required:** PREPARE a statement showing estimate of Working Capital needed to finance an activity level of 1,30,000 units of production. Assume that production is carried on evenly throughout the year, and wages and overheads accrue similarly. Work-in-progress stock is 80% complete in all respects. Use Cash Cost.

Solution:

Statement showing Estimate of Working Capital Needs (Amount in Rs) (Amount in Rs)

A. Current Assets

(i) Inventories:

Raw material (1 month or 4 weeks)

$[(1,30,000 \text{ units} \times \text{Rs } 100) / 52 \text{ weeks}] \times 4 \text{ weeks}$ 10,00,000

WIP Inventory (1 week)

$[(1,30,000 \text{ units} \times \text{Rs } 212.50) / 52 \text{ weeks}] \times 1 \text{ weeks} \times 0.8$ 4,25,000

Finished goods inventory (2 weeks)

$[(1,30,000 \text{ units} \times \text{Rs } 212.50) / 52 \text{ weeks}] \times 2 \text{ weeks}$ 10,62,500 24,87,500

(ii) Receivables (Debtors) (4 weeks)

$[(1,30,000 \text{ units} \times \text{Rs } 212.50) / 52 \text{ weeks}] \times 4 \text{ weeks} \times 4 / 5$ 17,00,000

(iii) Cash and bank balance

37,500

Total Current Assets

42,25,000

B. Current Liabilities:

(i) Payables (Creditors) for materials (3 weeks)

$[(1,30,000 \text{ units} \times \text{Rs } 100) / 52 \text{ weeks}] \times 3 \text{ weeks}$ 7,50,000

(ii) Outstanding wages (1 week)

$[(1,30,000 \text{ units} \times \text{Rs } 37.50) / 52 \text{ weeks}] \times 1 \text{ weeks}$ 93,750

(iii) Outstanding overheads (2 weeks)

$[(1,30,000 \text{ units} \times \text{Rs } 75) / 52 \text{ weeks}] \times 2 \text{ weeks}$ 3,75,000

Total Current Liabilities

12,18,750

Net Working Capital Needs (A – B)

30,06,250

DIVIDEND DECISION

Question No.9 The following figures are collected from the annual report of XYZ Ltd.:

Net Profit	Rs 30 lakhs
Outstanding 12% preference shares	Rs 100 lakhs
No. of equity shares	3 lakhs
Return on Investment	20%
Cost of capital i.e. (Ke)	16%

Calculate: Price per share using Gordon's Model when dividend pay-out is (i) 25%; (ii) 50% and (iii) 100%.

Solution:

	Rs in lakhs
Net Profit	30
Less: Preference dividend	<u>12</u>
Earning for equity shareholders	18
Therefore earning per share	18/3 = Rs 6.00

Price per share according to Gordon's Model is calculated as follows: $P_0 = \frac{E_1(1-b)}{K_e - br}$

$$(i) \text{ When dividend pay-out is 25\%: } P_0 = \frac{6 \times 0.25}{0.16 - (0.75 \times 0.2)} = 1.5 / (0.16 - 0.15) = 150$$

$$(ii) \text{ When dividend pay-out is 50\%: } P_0 = \frac{6 \times 0.5}{0.16 - (0.5 \times 0.2)} = 3 / (0.16 - 0.10) = 50$$

$$(iii) \text{ When dividend pay-out is 100\%: } P_0 = \frac{6 \times 1}{0.16 - (0 \times 0.2)} = 6 / 0.16 = 37.50$$

RATIO ANALYSIS

REASON OF IMPROVE/ DECLINE/ NO CHANGE IN RATIO

Question No.1 Assuming the current ratio of a Company is 2, STATE in each of the following cases whether the ratio will improve or decline or will have no change:

- | | |
|-------------------------------------|---------------------------------------|
| (i) Payment of current liability | (ii) Purchase of fixed assets by cash |
| (iii) Cash collected from Customers | (iv) Bills receivable dishonoured |
| (v) Issue of new shares | |

Solution:

Current Ratio = Current Assets / Current Liabilities = 2 i.e. 2 : 1

<u>S.No</u>	<u>Situation</u>	<u>Improve/ Decline/ No Change</u>	<u>Reason</u>
(i)	<u>Payment of Current liability</u>	Current Ratio will improve	Let us assume CA is Rs 2 lakhs & CL is Rs 1 lakh. If payment of Current Liability = Rs10,000 then, CA = 1, 90,000 CL = 90,000. Current Ratio = 1,90,000 / 90,000 = 2.11 : 1. When Current Ratio is 2:1 Payment of Current liability will reduce the same amount in the numerator and denominator. Hence, the ratio will improve.
(ii)	<u>Purchase of Fixed Assets by cash</u>	Current Ratio will decline	Since the cash being a current asset converted into fixed asset, current assets reduced, thus current ratio will fall.
(iii)	<u>Cash collected from Customers</u>	Current Ratio will not change	Cash will increase and Debtors will reduce. Hence No Change in Current Asset.
(iv)	<u>Bills Receivable dishonoured</u>	Current Ratio will not change	Bills Receivable will come down and debtors will increase. Hence no change in Current Assets. Note: Assumed Bills Receivable amount will be added to Debtors.
(v)	<u>Issue of New Shares</u>	Current Ratio will improve	As Cash will increase, Current Assets will increase and current ratio will increase.

LEVERAGES

Question No.4 A firm has sales of Rs 75,00,000 variable cost is 56% and fixed cost is Rs 6,00,000. It has a debt of Rs 45,00,000 at 9% and equity of Rs 55,00,000. **You are required to INTERPRET:** (i) The firm's ROI? (ii) Does it have favourable financial leverage? (iii) If the firm belongs to an industry whose capital turnover is 3, does it have a high or low capital turnover? (iv) The operating, financial and combined leverages of the firm? (v) If the sales is increased by 10% by what percentage EBIT will increase? (vi) At what level of sales the EBT of the firm will be equal to zero? (vii) If EBIT increases by 20%, by what percentage EBT will increase?

Solution:**Income Statement**

<u>Particulars</u>	<u>Amount</u>
Sales	75,00,000
Less: Variable cost (56% of 75,00,000)	(42,00,000)
Contribution	33,00,000
Less: Fixed costs	(6,00,000)
Earnings before interest and tax (EBIT)	27,00,000
Less: Interest on debt(@ 9% on Rs 45 lakhs)	(4,05,000)
Earnings before tax (EBT)	22,95,000

(i) $ROI = [EBIT / \text{Capital employed}] \times 100 = [EBIT / (\text{Equity} + \text{Debt})] \times 100$

$= [27,00,000 / (55,00,000 + 45,00,000)] \times 100 = 27\%$

(ii) ROI = 27% and Interest on debt is 9%, hence, it has a favourable financial leverage.

(iii) Capital Turnover = Net Sales/ Capital = Rs 75,00,000/ 1,00,00,000

Which is very low as compared to industry average of 3.

(iv) Calculation of Operating, Financial and Combined leverages

(a) **Operating Leverage** = Contribution / EBIT = Rs 33,00,000/ Rs 27,00,000 = 1.22 (approx)

(b) **Financial Leverage** = EBIT / EBT = Rs 27,00,000 / Rs 22,95,999 = 1.18 (approx)

(c) **Combined Leverage** = Contribution / EBT = Rs 33,00,000 / Rs 22,95,000 = 1.44 (approx)

Or = Operating Leverage x Financial Leverage = 1.22 x 1.18 = 1.44 (approx)

(v) Operating leverage is 1.22. So if sales is increased by 10%. EBIT will be increased by 1.22 x 10 i.e. 12.20% (approx)

(vi) Since the combined Leverage is 1.44, sales have to drop by 100/1.44 i.e. 69.44% to bring EBT to Zero.

Accordingly, New Sales = Rs 75,00,000 x (1-0.6944) = Rs 75,00,000 x 0.3056 = Rs 22,92,000 (approx)

Hence at Rs22,92,000 sales level EBT of the firm will be equal to Zero.

(vii) Financial leverage is 1.18. So, if EBIT increases by 20% then EBT will increase by 1.18 x 20 = 23.6% (approx)

CAPITAL BUDGETING-PART 1**INTERNAL RATE OF RETURN OF THE REPLACEMENT DECISION**

Question No.5 Shiv Limited is thinking of replacing its existing machine by a new machine which would cost Rs 60 lakhs. The company's current production is 80,000 units, and is expected to increase to 1,00,000 units, if the new machine is bought. The selling price of the product would remain unchanged at Rs 200 per unit. The following is the cost of producing one unit of product using both the existing and new machine: Unit cost (Rs)

	<u>Existing Machine</u> <u>(80,000 units)</u>	<u>New Machine</u> <u>1,00,000 units)</u>	<u>Difference</u>
Materials	75.0	63.75	(11.25)
Wages & Salaries	51.25	37.50	(13.75)
Supervision	20.0	25.0	5.0
Repairs and Maintenance	11.25	7.50	(3.75)
Power and Fuel	15.50	14.25	(1.25)
Depreciation	0.25	5.0	4.75
Allocated Corporate Overheads	10.0	12.50	2.50
	<u>183.25</u>	<u>165.50</u>	<u>(17.75)</u>

The existing machine has an accounting book value of Rs 1,00,000, and it has been fully depreciated for tax purpose. It is estimated that machine will be useful for 5 years. The supplier of the new machine has offered to accept the old machine for Rs 2,50,000. However, the market price of old machine today is Rs 1,50,000 and it is expected to be Rs 35,000 after 5 years. The new machine has a life of 5 years and a salvage value of Rs 2,50,000

at the end of its economic life. Assume corporate Income tax rate at 40%, and depreciation is charged on straight line basis for Income-tax purposes. Further assume that book profit is treated as ordinary income for tax purpose. The opportunity cost of capital of the Company is 15%. **Required:**

- (i) ESTIMATE net present value of the replacement decision.
(ii) CALCULATE the internal rate of return of the replacement decision.
(iii) Should Company go ahead with the replacement decision? ANALYSE.

<u>Year (t)</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
PVIF _{0.15,t}	0.8696	0.7561	0.6575	0.5718	0.4972
PVIF _{0.20,t}	0.8333	0.6944	0.5787	0.4823	0.4019
PVIF _{0.25,t}	0.80	0.64	0.512	0.4096	0.3277
PVIF _{0.30,t}	0.7692	0.5917	0.4552	0.3501	0.2693
PVIF _{0.35,t}	0.7407	0.5487	0.4064	0.3011	0.2230

Solution

Note:Net Cash Outlay of New Machine: Purchase Price Rs 60,00,000
Less: Exchange value of old machine[2,50,000 - 0.4(2,50,000 - 0)] Rs 1,50,000
Rs 58,50,000

Note:Market Value of Old Machine: The old machine could be sold for Rs 1,50,000 in the market. Since the exchange value is more than the market value, this option is not attractive. This opportunity will be lost whether the old machine is retained or replaced. Thus, on incremental basis, it has no impact.

Note:Depreciation base: Old machine has been fully depreciated for tax purpose. Thus, the depreciation base of the new machine will be its original cost i.e. Rs 60,00,000.

Note:Allocated overheads are allocated from corporate office therefore they are irrelevant. Hence ignored.

Note:The company will obtain additional revenue from additional 20,000 units sold.

Note:Net Cash flows from operation can be calculated as follows:

Profit before depreciation & tax=1,00,000(200-165.50-12.5-5)-80,000(200-183.25-10-.25)=52,00,000-21,60,000=
Rs.30,40,000

So profit after depreciation and tax is Rs (30,40,000 -11,50,000) x (1 - .40) = Rs 11,34,000

So profit before depreciation & after tax is :Rs 11,34,000 + Rs 11,50,000 (Depreciation added back) = Rs 22,84,000

Calculation of Cash flows and Project Profitability [Rs ('000)]

	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
4. Net cash flows from operations	-	2284	2284	2284	2284	2284
5. Initial cost	(5850)					
6. Net Salvage Value (2,50,000 - 35,000*)	-	-	-	-	-	215
7. Net Cash Flows (4+5+6)	<u>(5850)</u>	<u>2284</u>	<u>2284</u>	<u>2284</u>	<u>2284</u>	<u>2499</u>
8. PVF at 15%	1.00	0.8696	0.7561	0.6575	0.5718	0.4972
9. PV	(5850)	1986.166	1726.932	1501.73	1305.99	1242.50
10. NPV		Rs 1913.32				

* We could have taken also take 35000 - .40 x 35000 = 21000 in place of 35000.If we sell old asset after 5 year we will get 35000.Full 35000 will be profit on sale of ols asset.In this we will be required to pay .40 x 35000 as tax.

	<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
NCF	(5850)	2284	2284	2284	2284	2499
PVF at 25%	1.00	0.8	0.64	0.512	0.4096	0.32768
PV	(5850)	1827.2	1461.76	1169.408	935.5264	818.87
PV of benefits		362.77				

PVF at 30%	1.00	0.7692	0.5917	0.4550	0.3501	0.2693
PV	(5850)	1756.85	1351.44	1039.22	799.63	672.98
PV of benefits	-229.88					

IRR = 25% + 5% x [362.77 / 362.77 - (-229.88)] = 28.06%

(iii) Advise: The Company should go ahead with replacement project, since it is positive NPV decision.

CAPITAL BUDGETING-PART 1

Question No.8 Gauv Ltd. using certainty-equivalent approach in the evaluation of risky proposals. The following information regarding a new project is as follows:

<u>Year</u>	<u>Expected Cash flow</u>	<u>Certainty-equivalent quotient</u>
0	(4,00,000)	1.0
1	3,20,000	0.8
2	2,80,000	0.7
3	2,60,000	0.6
4	2,40,000	0.4
5	1,60,000	0.3

Riskless rate of interest on the government securities is 6 per cent. **DETERMINE** whether the project should be accepted?

Solution:

<u>Year</u>	<u>Expected Cash flow (Rs)</u>	<u>Certainty-equivalent (CE)</u>	<u>Adjusted Cash flow (Cash flow x CE) (Rs)</u>	<u>PV factor (at 0.06)</u>	<u>Total PV</u>
0	(4,00,000)	1.0	(4,00,000)	1.000	(4,00,000)
1	3,20,000	0.8	2,56,000	0.943	2,41,408
2	2,80,000	0.7	1,96,000	0.890	1,74,440
3	2,60,000	0.6	1,56,000	0.840	1,31,040
4	2,40,000	0.4	96,000	0.792	76,032
5	1,60,000	0.3	48,000	0.747	35,856
					<u>2,58,776</u>

Decision: As the Net Present Value is positive the project should be accepted.

CAPITAL BUDGETING-PART 1

Question No.5 A company has to make a choice between two projects namely A and B. The initial capital outlay of two Projects are Rs 1,35,000 and Rs 2,40,000 respectively for A and B. There will be no scrap value at the end of the life of both the projects. The opportunity Cost of Capital of the company is 16%. The annual incomes are as under:

<u>Year</u>	<u>Project A</u>	<u>Project B</u>	<u>Discounting factor @ 16%</u>
1	--	60,000	0.862
2	30,000	84,000	0.743
3	1,32,000	96,000	0.641
4	84,000	1,02,000	0.552
5	84,000	90,000	0.476

Required: CALCULATE for each project: (i) Discounted payback period (ii) Profitability index (iii) Net present value DECIDE which of these projects should be accepted?

Solution:

Working notes

1. Computation of Net Present Values of Projects:

Year	Cash flows		Disct. factor @ 16 %	Discounted Cash flow	
	Project A (Rs)	Project B (Rs)		Project A (Rs)	Project B (Rs)
	(1)	(2)	(3)	(3) x(1)	(3) x(2)
0	(1,35,000)	(2,40,000)	1.000	(1,35,000)	(2,40,000)
1	--	60,000	0.862	--	51,720
2	30,000	84,000	0.743	22,290	62,412
3	1,32,000	96,000	0.641	84,612	61,536
4	84,000	1,02,000	0.552	46,368	56,304
5	<u>84,000</u>	<u>90,000</u>	<u>0.476</u>	<u>39,984</u>	<u>42,840</u>
		Net present value		<u>58,254</u>	<u>34,812</u>

2.Computation of Cumulative Present Values of Projects Cash inflows

Year	Project A		Project B	
	PV of cash inflows	Cumulative PV	PV of cash inflows	Cumulative PV
1	--	--	51,720	51,720
2	22,290	22,290	62,412	1,14,132
3	84,612	1,06,902	61,536	1,75,668
4	46,368	1,53,270	56,304	2,31,972
5	39,984	1,93,254	42,840	2,74,812

(i) Discounted payback period:

$$\text{Project A} = 3 + \frac{(1,35,000 - 1,06,902)}{46,368} = 3.61 \text{ year} ; \text{Project B} = 4 + \frac{(2,40,000 - 2,31,972)}{42,840} = 4.19 \text{ years}$$

(ii) **Profitability Index(PI):** Sum of discounted cash inflows / Initial cash outlay

Profitability Index (for Project A) = Rs 1,93,254 / Rs 1,35,000 = 1.43

Profitability Index (for Project B) = Rs 2,74,812 / Rs 2,40,000 = 1.15

(iii) **Net present value(NPV)** (for Project A) = Rs 58,254

Net present value(NPV) (for Project B) = Rs 34,812 (Refer to Working note 1)

Conclusion: As the NPV, PI of Project A is higher and Discounted Pay back is lower, therefore Project "A" should be accepted.

COST OF CASH DISCOUNT

Question No.6 A Ltd. is in the manufacturing business and it acquires raw material from X Ltd. on a regular basis. As per the terms of agreement the payment must be made within 40 days of purchase.

However, A Ltd. has a choice of paying Rs.98.50 per Rs. 100 it owes to X Ltd. on or before 10th day of purchase.

Required: EXAMINE whether A Ltd. should accept the offer of discount assuming average billing of A Ltd. with X Ltd. is Rs. 10,00,000 and an alternative investment yield a return of 15% and company pays the invoice.

Solution:

Alternative 1: Annual Benefit of accepting the Discount: [Rs 1.5 / Rs100-Rs1.50] x [365days / 40-10days] = 18.53% ; Annual Cost = Opportunity Cost of foregoing interest on investment = 15%

Alternative 2: If average invoice amount is Rs 10,00,000

	If discount is	
	Accepted(Rs)	Not Accepted (Rs)
Payment to Supplier (Rs)	9,85,000	10,00,000
Return on investment of Rs9,85,000 for 30 days {Rs 9,85,000 x (30/365) x 15%}	<u>9,85,000</u>	<u>(12,144)</u>
		<u>9,87,856</u>

Decision: Thus, from above table it can be seen that it is cheaper to accept the discount.

Note: In exam, both calculations must be shown.

RATIO ANALYSIS

QUESTION NO.2 Based on the following particulars List out various assets and liabilities and prepare a Balance sheet of Tirupati Ltd.

Fixed assets turnover ratio	8 times
Capital turnover ratio	2 times
Inventory Turnover	8 times
Receivable turnover	4 times
Payable turnover	6 times
GP Ratio	25%

Gross profit during the year amounts to Rs8,00,000. There is no long-term loan or overdraft. Reserve and surplus amount to Rs2,00,000. Ending inventory of the year is Rs20,000 above the beginning inventory.

Solution:

$$(a) \text{G.P. ratio} = \frac{\text{Grossprofit}}{\text{sales}} = 25\% \text{ or } \text{Sales} = \frac{\text{Gross Profit}}{25} \times 100 = \frac{\text{Rs}8,00,000}{25} \times 100 = \text{Rs}32,00,000$$

$$(b) \text{Cost of Sales} = \text{Sales} - \text{Gross profit} = 32,00,000 - 8,00,000 = 24,00,000$$

$$(c) \text{Receivable turnover} = \frac{\text{sales}}{\text{receivables}} \text{ i.e } 4 = \frac{\text{sales}}{\text{receivables}} \text{ or } \text{Receivables} = \frac{\text{Sales}}{4} = \frac{\text{Rs } 32,00,000}{4} = \text{Rs } 8,00,000$$

$$(d) \text{Fixed assets turnover} = \frac{\text{cost of goods sold}}{\text{Fixed Assets}} \text{ i.e } 8 = \frac{\text{cost of sales}}{\text{Fixed Assets}} \text{ or}$$

$$\text{Fixed Assets} = \frac{\text{Cost of Goods Sold}}{8} = \frac{\text{Rs}24,00,000}{8} = \text{Rs } 3,00,000$$

$$(e) \text{Inventory turnover} = \frac{\text{cost of goods sold}}{\text{average stock}} \text{ i.e } 8 = \frac{\text{cost of goods sold}}{\text{average stock}} \text{ or}$$

$$\text{Average stock} = \frac{\text{cost of goods sold}}{8} = \frac{\text{Rs } 24,00,000}{8} = \text{Rs } 3,00,000$$

$$\text{Average Stock} = \frac{\text{opening stock} + \text{closing stock}}{2} \text{ or } \text{Average stock} = \frac{\text{opening stock} + \text{opening stock} + 20,000}{2}$$

or Average stock = opening stock + Rs10,000

Opening stock = Average stock - Rs10,000 = Rs3,00,000 - Rs10,000 = Rs2,90,000

Closing Stock = Opening Stock + Rs20,000 = 2,90,000 + Rs20,000 = Rs3,10,000

$$(f) \text{Payable turnover} = \frac{\text{purchase}}{\text{creditor}} \text{ i.e } 6 = \frac{\text{purchase}}{\text{creditor}}$$

Purchase = cost of sales + Increase in stock = Rs 24,00,000 + Rs 20,000 = Rs 24,20,000

Note: COGS = Opening Stock + Purchases - Closing Stock ; Also note that Increase In Stock = Closing Stock - Opening Stock

$$\text{Payables (Creditors)} = \frac{\text{Purchase}}{6} = \frac{\text{Rs } 24,20,000}{6} = \text{Rs } 4,03,333$$

$$(g) \text{Capital turnover} = \frac{\text{Cost of sales}}{\text{capital employed}} \text{ i.e } 2 = \frac{\text{Cost of sales}}{\text{capital employed}}$$

$$\text{or Capital Employed} = \frac{\text{cost of sales}}{2} = \frac{\text{Rs}24,00,000}{2} = 12,00,000$$

$$\text{(h) Share Capital} = \text{Capital Employed} - \text{Reserve and Surplus} = \text{Rs } 12,00,000 - \text{Rs}2,00,000 = \text{Rs}10,00,000$$

Balance Sheet of Tirupati Ltd as on

<u>Liabilities</u>	<u>Amount (Rs)</u>	<u>Assets</u>	<u>Amount (Rs)</u>
Share Capital	10,00,000	Fixed Assets	3,00,000
Reserve & Surplus	2,00,000	Closing Inventories	3,10,000
Payables	4,03,333	Receivables	8,00,000
	-	Other Current Assets(balance fig)	1,93,333
	<u>16,03,333</u>		<u>16,03,333</u>

Note: Fixed Asset turnover, inventory turnover capital turnover is calculated on cost of goods sold.

COST OF CAPITAL

QUESTION NO.1 JC Ltd. is planning an equity issue in current year. It has an earning per share (EPS) of Rs20 and proposes to pay 60% dividend at the current year end [Hint: It means Year end]. With a P/E ratio 6.25, it wants to offer the issue at market price. The flotation cost is expected to be 4% of the issue price.

Required: Determine the required rate of return for equity share (cost of equity) before the issue and after the issue

Solution:

Workings

- $P_0 = \text{EPS} \times \text{P/E} = 20 \times 6.25 = 125$
- $r = \text{Rate of Return on Retained Earnings} = 1/6.25 = 16\%$ [Note: Assumed $r = k_e$]
- $\text{Retention ratio}(b) = 1 - \text{Dividend Payout Ratio} = 1 - 0.60 = 0.40$
- $\text{Growth rate}(g) = br = 0.40 \times 0.16 = 0.064$
- $D_0 = \text{EPS} \times \text{Dividend Payout} = 20 \times 60\% = 12$
- $D_1 = D_0 (1 + g) = 12 (1 + 0.064) = 12.768$

Cost of Equity before issue : $K_e = \frac{D_1}{P_0} + g = \frac{12.768}{125} + 0.064 = 0.1021 + 0.064 = 0.1661$ or 16.61%

Cost of Equity after issue : $K_e = \frac{D_1}{P_0} + g = \frac{12.768}{120} + 0.064 = 0.1064 + 0.064 = 0.1704$ or 17.04%

RATIO ANALYSIS

QUESTION NO.2 G Ltd. has furnished the following information relating to the year ended 31st March, 2017 and 31st March, 2018:

	<u>31st March, 2017</u>	<u>31st March, 2018</u>
Share Capital	40,00,000	40,00,000
Reserve and Surplus	20,00,000	25,00,000
Long term loan	30,00,000	30,00,000

- Net profit ratio: 8%
- Gross profit ratio: 20%
- Long-term loan has been used to finance 40% of the fixed assets.
- Stock turnover with respect to cost of goods sold is 4.
- Debtors represent 90 days sales.
- The company holds cash equivalent to 1.5 months of cost of goods sold.

• Ignore taxation and assume 360 days in a year.

You are required to prepare Balance Sheet as on 31 st March, 2018 in following format:

<u>Liabilities(Rs)</u>	<u>Assets(Rs)</u>
Share Capital -	Fixed Assets -
Reserve and Surplus -	Sundry Debtors -
Long-term loan -	Closing Stock -
Sundry Creditors -	Cash in hand -

(8 Marks)

Solution:

Change in Reserve & Surplus = Rs 25, 00,000 - Rs20,00,000 = Rs 5,00,000

So, Net profit = Rs 5, 00,000

(i)Net Profit Ratio = 8% or NP/Sales = 8% or Sales = $\frac{5,00,000}{8\%}$ =Rs 62,50,000

(ii)Cost of Goods sold = Sales - Gross profit Margin = Rs62, 50,000 - 20% of Rs 62, 50,000 = Rs 50, 00,000

(iii)Fixed Assets = $\frac{\text{Rs}30,00,000}{40\%}$ =Rs 75,00,000

(iv)Stock = $\frac{\text{Cost of Goods Sold}}{\text{STR}} = \frac{\text{Rs } 50,00,000}{4}$ =Rs12,50,000

(v)Debtors = $\frac{62,50,000}{360} \times 90$ = Rs 15,62,500

(vi)Cash Equivalent = $\frac{\text{Rs } 50,00,000}{12} \times 1.5$ = Rs 6,25,000

Balance Sheet as on 31st March 2018

<u>Liabilities</u>	<u>(Rs)</u>	<u>Assets</u>	<u>(Rs)</u>
Share Capital	40,00,000	Fixed Assets	75,00,000
Reserve and Surplus	25,00,000	Sundry Debtors	15,62,500
Long-term loan	30,00,000	Closing Stock	12,50,000
Sundry Creditors	14,37,500	Cash in hand	6,25,000
(Balancing Figure)	-		-
	<u>1,09,37,500</u>		<u>1,09,37,500</u>

LEVERAGES

QUESTION NO.3 (8 Marks) Following are the selected financial information of A Ltd. and B Ltd. for the year ended March 31, 2018:

	<u>A Ltd.</u>	<u>B Ltd.</u>
Variable Cost Ratio	60%	50%
Interest	Rs20,000	Rs 1,00,000
Operating Leverage	5	2
Financial Leverage	3	2
Tax Rate	30%	30%

You are required to find out

(i)EBIT (ii)Sales (iii)Fixed Cost (iv)Identify the company which is better placed with reasons based on leverages.

Solution:

Company A

(i)Financial Leverage = $\frac{\text{EBIT}}{\text{EBIT} - \text{Interest}}$ So, 3 = $\frac{\text{EBIT}}{\text{EBIT} - 20,000}$ Or EBIT =30,000

$$\text{(ii) Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} \text{ or } 5 = \frac{\text{Contribution}}{30,000} \text{ or Contribution} = \text{Rs } 1,50,000$$

$$\text{Sales} = \frac{\text{Contribution}}{\text{P/V Ratio}} = \frac{\text{Rs } 1,50,000}{40\%} = \text{Rs } 3,75,000$$

$$\text{(iii) Fixed Cost} = \text{Contribution} - \text{EBIT} = \text{Rs } 1,50,000 - \text{Rs } 30,000 \text{ or, Fixed cost} = \text{Rs } 1,20,000$$

$$\text{(i) Financial Leverage} = \frac{\text{EBIT}}{\text{EBT i.e. EBIT} - \text{Interest}} \text{ So, } 2 = \frac{\text{EBIT}}{\text{EBIT} - 10,000} \text{ Or, EBIT} = \text{Rs } 2,00,000$$

$$\text{(ii) Operating Leverage} = \frac{\text{Contribution}}{\text{EBIT}} \text{ Or, } 2 = \frac{\text{Contribution}}{\text{Rs } 2,00,000} \text{ or Contribution} = 4,00,000$$

$$\text{Sales} = \frac{\text{Contribution}}{\text{P/V Ratio}} = \frac{\text{Rs } 4,00,000}{50\%} = \text{Rs } 8,00,000$$

$$\text{(iii) Fixed Cost} = \text{Contribution} - \text{EBIT} = \text{Rs } 4,00,000 - \text{Rs } 2,00,000 \text{ or, Fixed cost} = \text{Rs } 2,00,000$$

Income Statements of Company A and Company B

	<u>Company A</u>	<u>(Rs) Company B (Rs)</u>
Sales	3,75,000	8,00,000
Less: Variable cost	<u>2,25,000</u>	<u>4,00,000</u>
Contribution	1,50,000	4,00,000
Less: Fixed Cost	<u>1,20,000</u>	<u>2,00,000</u>
Earnings before interest and tax	30,000	2,00,000
Less: Interest	<u>20,000</u>	<u>1,00,000</u>
Earnings before tax (EBT)	10,000	1,00,000
Less: Tax @ 30%	<u>3,000</u>	<u>30,000</u>
Earnings after tax (EAT)	<u>7,000</u>	<u>70,000</u>

Comment based on Leverage: Company B is better than company A of the following reasons:

- Capacity of Company B to meet interest liability is better than that of companies A (from EBIT/Interest ratio)

$$[A = \frac{30,000}{20,000} = 1.5, B = \frac{2,00,000}{1,00,000} = 2]$$

- Company B has the least financial risk .
- Total risk of company B is lower (Combined Leverage of Company A - 15 and Company B - 4)

CAPITAL STRUCTURE

Question No.1(5 marks) A Ltd. and B Ltd. are identical in every respect except capital structure. A Ltd. does not employ debt in its capital structure, whereas B Ltd. employs 12% debentures amounting to Rs. 10 lakh. Assuming that - **(i)** All assumptions of MM model are met **(ii)** The income tax rate is 30% **(iii)** EBIT is Rs. 2,50,000 and **(iv)** The equity capitalization rate of A Ltd. is 20%. **CALCULATE:** the average Value of both the companies.

Solution:

Firm A Ltd. (pure equity): unlevered firm: EAT = EBIT (1 - t) = Rs. 2,50,000 x 0.7 = Rs. 1,75,000

Value of unlevered firm A = EAT / Equity capitalization rate = Rs. 1,75,000 / 20% = Rs. 8,75,000

Firm B Ltd. (levered): Value of levered firm = Value of Unlevered Firm + Value of debt x Tax Rate
= Rs. 8,75,000 + (10,00,000) x 0.3 = Rs. 11,75,000

COST OF CAPITAL

Question No.5(10 Marks) The capital structure of RV Limited as on 31st March, 20X8 as per its balance sheet is as follows:

<u>Particulars</u>	<u>Rs.</u>
Equity shares of Rs. 10 each	25,00,000
10% Preference shares of Rs. 100 each	5,00,000
Retained earnings	5,00,000
13% debentures of Rs. 100 each	20,00,000

The market price of equity shares is Rs. 50 per share. Expected dividend on equity shares is Rs 3 per share. The dividend per share is expected to grow at the rate of 8%. Preference shares are redeemable after eight years and the current market price is Rs. 80 per share. Debenture are redeemable after five years and are currently selling at Rs. 90 per debenture. The tax rate applicable to the company is 35%.

CALCULATE: weighted average cost of capital using: (i) Book value proportions (ii) Market value proportions

Solution:

$$(i) \text{ Cost of Equity } (K_e) = D_1 + \frac{P}{G} = (Rs\ 3 / Rs\ 50) + 0.08 = 0.14 = 14\%$$

$$(ii) \text{ Cost of preference shares } (K_p) = \frac{D + \left(\frac{RV - NP}{N}\right)}{\left(\frac{RV + NP}{2}\right)} = \frac{Rs10 + \left(\frac{Rs100 - Rs80}{8}\right)}{\left(\frac{Rs100 + Rs80}{2}\right)} = 12.5 / 90 = 0.1389 = 13.89\%$$

$$(iii) \text{ Cost of debenture } (K_d): \frac{I(1-t) + \left(\frac{RV - NP}{N}\right)}{\left(\frac{RV + NP}{2}\right)} = \frac{Rs13(1-0.35) + \left(\frac{Rs100 - Rs90}{5}\right)}{\left(\frac{Rs100 + Rs90}{5}\right)} = (8.45+2) / 95 = 0.11 = 11\%$$

Weighted Average cost of capital (Book Value)

	<u>Amount Rs.</u>	<u>Weight (W)</u>	<u>Cost (K)</u>	<u>WxK</u>
Equity shares	25,00,000	0.4546	0.14	0.0636
Preference shares	5,00,000	0.0909	0.1389	0.0126
Retained Earnings	5,00,000	0.0909	0.14	0.0127
Debentures	20,00,000	0.3636	0.1026	0.0373
	<u>55,00,000</u>			<u>0.1262</u>

Thus WACC (Book value based) = 12.62%

Weighted Average cost of capital market valued

	<u>Amount Rs.</u>	<u>Weight (W)</u>	<u>Cost (K)</u>	<u>WxK</u>
Equity shares(2,50,000x50)	1,25,00,000	0.85	0.14	0.119
Preference shares(5000x80)	4,00,000	0.028	0.1389	0.0039
Debentures(20000x90)	18,00,000	0.122	0.1026	0.0125
	<u>1,47,00,000</u>			<u>0.1354</u>

Thus WACC (Market value based) = 13.54%

CAPITAL STRUCTURE

Question No.4 (10 Marks) G Limited has the following capital structure, which it considers to be optimal:

<u>Capital Structure</u>	<u>Weightage (in %)</u>
Debt	25

Preference Shares	15
Equity Shares	<u>60</u>
	<u>100</u>

G Limited's expected net income this year is Rs 34,285.72, its established dividend payout ratio is 30 per cent, its tax rate is 40 per cent, and investors expect earnings and dividends to grow at a constant rate of 9 per cent in the future. It paid a dividend of Rs 3.60 per share last year, and its shares currently sells at a price of Rs 54 per share. G Limited requires additional funds which it can obtain in the following ways:

• **Preference Shares:** New preference shares with a dividend of Rs. 11 can be sold to the public at a price of Rs 95 per share. • **Debt:** Debt can be sold at an interest rate of 12 per cent.

You are required to: (i) DETERMINE the cost of each capital structure component; and (ii) COMPUTE the weighted average cost of capital (WACC) of G Limited.

Solution:

(i) Computation of Costs of Different Components of Capital:

(a) Equity Shares: $\frac{D_1}{P_0} + G = \frac{D_0(1+G)}{P_0} + G = [Rs\ 3.60\ (1.09) / Rs\ 54] + 0.09 = 0.0727 + 0.09 = 16.27\%$.

(b) Preference Shares: $K_p = \frac{\text{Preference Dividend}}{P_0} = Rs\ 11 / Rs\ 95 = 11.58\%$.

(c) Debt at 12%: $K_d (1 - t) = 12\% (1 - 0.4) = 12\% \times 0.6 = 7.20\%$.

(ii) Weighted Average Cost of Capital (WACC)

$WACC = W_d K_d + W_p K_p + W_e K_e$ or $WACC = 0.25 (7.2\%) + 0.15 (11.58\%) + 0.60 (16.27\%) = 13.30\%$.

CAPITAL BUDGETING-PART 1

Question No.5 (10 Marks) You are a financial analyst of B Limited. The director of finance has asked you to analyse two capital investments proposals, Projects X and Y. Each project has a cost of Rs.10,000 and the cost of capital for each project is 12 per cent. The project's expected net cash flows are as follows:

<u>Year</u>	<u>Expected net cash flows</u>	
	<u>Project X (Rs)</u>	<u>Project Y (Rs)</u>
0	(10,000)	(10,000)
1	6,500	3,500
2	3,000	3,500
3	3,000	3,500
4	1,000	3,500

(i) CALCULATE each project's payback period, net present value (NPV) and internal rate of return (IRR).

(ii) DETERMINE, which project or projects should be accepted if they are independent

Solution:

(i) Payback Period Method

The cumulative cash flows for each project are as follows:

<u>Year</u>	<u>Cumulative Cash Flows</u>	
	<u>Project X (Rs)</u>	<u>Project Y (Rs)</u>
1	6,500	3,500
2	9,500	7,000
3	12,500	10,500
4	13,500	14,000

$Payback_x = 2 + [Rs\ 500 / Rs\ 3000] = 2.17\ \text{years}; Payback_y = 2 + [Rs\ 3000 / Rs\ 3500] = 2.86\ \text{years}.$

Net Present Value (NPV)

$$NPV_x = -Rs10,000 + \frac{Rs6,500}{(1.12)^1} + \frac{Rs3,000}{(1.12)^2} + \frac{Rs3,000}{(1.12)^3} + \frac{Rs1,000}{(1.12)^4} = Rs 996.01$$

$$NPV_y = -Rs10,000 + \frac{Rs3,500}{(1.12)^1} + \frac{Rs3,500}{(1.12)^2} + \frac{Rs3,500}{(1.12)^3} + \frac{Rs3,500}{(1.12)^4} = Rs 630.72.$$

Internal Rate of Return (IRR): $IRR_x = 18.0\%$; $IRR_y = 15.0\%$. [Self]

(ii) The following table summarizes the project rankings by each method:

	<u>Project that ranks higher</u>
Payback	X
NPV	X
IRR	X

Analysis: All methods rank Project X over Project Y. In addition, both projects are acceptable under the NPV and IRR criteria. Thus, both projects should be accepted if they are independent.

COST OF CAPITAL

Question No.1(4 Marks) The proportion and required return of debt and equity was recorded for a company with its increased financial leverage as below:

<u>Debt (%)</u>	<u>Required Return (Kd) (%)</u>	<u>Equity (%)</u>	<u>Required return (Ke) (%)</u>	<u>Weighted Average Cost of Capital (WACC) (Ko)(%)</u>
0	5	100	15	15
20	6	80	16	?
40	7	60	18	?
60	10	40	23	?
80	15	20	35	?

You are required to: complete the table and IDENTIFY which capital structure is most beneficial for this company. (Based on traditional theory, i.e., capital structure is relevant).

Solution:

Computation of Weighted Average Cost of Capital (WACC) for each level of Debt-equity mix:

<u>Debt (%)</u>	<u>Required return (Kd)(%)</u>	<u>Equity (%)</u>	<u>Required return (Ke)(%)</u>	<u>(Kd x Proportion of debt) + (Ke x Proportion and equity)</u>	<u>Weighted Average Cost of Capital (WACC)(Ko)(%)</u>
0	5	100	15	0%(5%)+100%(15%)	15
20	6	80	16	20%(6%)+80%(16%)	14
40	7	60	18	40%(7%)+60%(18%)	13.6
60	10	40	23	60%(10%)+40%(23%)	15.2
80	15	20	35	80%(15%)+20%(35%)	19

The optimum mix is 40% debt and 60% equity, as this will lead to lowest WACC value i.e., 13.6%.

COST OF CAPITAL**TERM LOAN VS DEBENTURES**

Question No.1 (4 Marks) Annova Ltd is considering raising of funds of about Rs.250 lakhs by any of two alternative methods, viz., 14% institutional term loan and 13% non-convertible debentures. The term loan option would

attract no major incidental cost and can be ignored. The debentures would have to be issued at a discount of 2.5% and would involve cost of issue of 2% on face value.

ADVISE the company as to the better option based on the effective cost of capital in each case. Assume a tax rate of 50%.

Solution: Calculation of Effective Cost of Capital

<u>Particulars</u>	<u>Option 1 14% institutional Term loan (Rs. in Lakhs)</u>	<u>Option 2 13% Non-convertible Debentures (Rs. in lakhs)</u>
(A) Effective capital to be raised Face value	250.00	250.00
Less: Discount	<u>Nil</u>	<u>(6.25)</u>
	250.00	243.75
Less: Cost of issue	<u>Nil</u>	<u>5.00</u>
Effective amount of capital	250.00	238.75
(B) Annual interest charges on face value of Rs. 250 lakhs	35.0	32.50
Less: Tax benefit on interest @ 50%	<u>17.5</u>	<u>16.25</u>
	17.5	16.25
(C) Effective cost of capital after tax	B / A x 100 = 7.0%	(16.25 / 238.75) X 100 = 6.81% (approx)

So, the better option is raising of funds of Rs.250 lakhs by issue of 13% Non -convertible Debenture

LEVERAGES

Question No.1(6 Marks) The capital structure of Anshu Ltd. as at 31.3.2019 consisted of ordinary share capital of Rs. 5,00,000 (face value Rs. 100 each) and 10% debentures of Rs. 5,00,000 (Rs. 100 each). In the year ended with March 2019, sales decreased from 60,000 units to 50,000 units. During this year and in the previous year, the selling price was Rs. 12 per unit; variable cost stood at Rs. 8 per unit and fixed expenses were at Rs. 1,00,000 p.a. The income tax rate was 30%. **You are required to CALCULATE** the following:

- The percentage of decrease in earnings per share.
- The degree of operating leverage at 60,000 units and 50,000 units.
- The degree of financial leverage at 60,000 units and 50,000 units.

Solution:

<u>Sales in units</u>	<u>60,000</u>	<u>50,000</u>
Sales Value	7,20,000	6,00,000
Variable Cost	<u>(4,80,000)</u>	<u>(4,00,000)</u>
Contribution	2,40,000	2,00,000
Fixed expenses	<u>1,00,000</u>	<u>1,00,000</u>
EBIT	1,40,000	1,00,000
Debenture Interest	<u>(50,000)</u>	<u>(50,000)</u>
EBT	90,000	50,000
Tax @ 30%	<u>(27,000)</u>	<u>(15,000)</u>
Profit after tax (PAT)	63,000	35,000
(i) Earning per share (EPS) =	Rs 63000 / Rs 5,000= Rs. 12.6	Rs 35,000 / 5000=Rs. 7
% Decrease in EPS =	12.6 - 7 = 5.6	
% Decease in EPS =	(5.6 / 12.6) x 100 = 44.44 %	
(ii) Operating leverage = Contribution / EBIT =	2,40,000/1,40,000=1.71	2,00,000 / 1,00,000 =2
(iii) Financial Leverage = EBIT/ EBT=	1,40,000/ 90,000=1.56	1,00,000/ 50,000=2

DEBTORS MANAGEMENT

Question No.3(a) (6 Marks) Navya Ltd has annual credit sales of Rs. 45 lakhs. Credit terms are 30 days, but its management of receivables has been poor and the average collection period is 50 days, Bad debt is 0.4 per cent of sales. A factor has offered to take over the task of debt administration and credit checking, at an annual fee of 1 per cent of credit sales. Navya Ltd. estimates that it would save Rs. 35,000 per year in administration costs as a result. Due to the efficiency of the factor, the average collection period would reduce to 30 days and bad debts would be zero. The factor would advance 80 per cent of invoiced debts at an annual interest rate of 11 per cent. Navya Ltd. is currently financing receivables from an overdraft costing 10 per cent per year.

If occurrence of credit sales is throughout the year,

COMPUTE whether the factor's services should be accepted or rejected. Assume 365 days in a year.

Solution:

Benefit:

Interest Earned Due Reduction In Debtors $2,46,575 \times 10\%$	24657.5
Saving of Administration costs	35,000
Saving of Bad debts $45 \text{ lakhs} \times 0.4\%$	18,000
Overdraft Interest Saved Due To Advance Received $3,69,863 \times .80 \times 10\%$	<u>29589.04</u>
Total Benefit (A)	<u>107246.54</u>

Cost:

Interest Paid on Advance Rs. $3,69,863 \times 0.8 \times 11$	32,547.94
Commission Charges $45 \text{ Lakhs} \times 0.01$	<u>45,000</u>
Total(B)	<u>77547.94</u>
Net Saving (A) - (B)	29699

Decision: From the above analysis it is clear that the factor's services are cheaper than Existing policy by Rs. 29,699 per year. Hence, the services of the factor should be accepted.

Working Note: Reduction In Debtors

Existing Debtors	$45 \text{ lakh} \times 50/365$	6,16,438
New Debtors	$45 \text{ lakhs} \times 30/365$	<u>3,69,863</u>
Reduction in Debtors		<u>2,46,575</u>

CAPITAL BUDGETING-PART 1

Question No.4(6 Marks) Prem Ltd has a maximum of Rs. 8,00,000 available to invest in new projects. Three possibilities have emerged and the business finance manager has calculated Net present Value (NPVs) for each of the projects as follows :

<u>Investment</u>	<u>Initial cash outlay Rs.</u>	<u>NPV Rs.</u>
Alfa (α)	5,40,000	1,00,000
Beta(β)	6,00,000	1,50,000
Gama (γ)	2,60,000	58,000

DETERMINE which investment/combination of investments should the company invest in, if we assume that the projects can be divided?

Solution:

Since funds available are restricted, the normal Net Present Value (NPV) rule of accepting investments decisions with the highest NPVs cannot be adopted straight way. Further, as the projects are divisible, a Profitability Index (PI) can be utilized to provide the most beneficial combination of investment.

<u>Project</u>	<u>PV Per Rs.</u>	<u>Rank as per PI</u>
Alfa (α)	Rs. 6,40,000 / Rs. 5,40,000 = 1.185	III
Beta (β)	Rs. 7,50,000 / Rs. 6,00,000 = 1.250	I
Gama (γ)	Rs. 3,18,000 / Rs. 2,60,000 = 1.223	II

Therefore Rio Ltd should invest Rs. 6,00,000 into project β (Rank I) NPV Rs. 1,50,000 and Rs.2,00,000 into project

γ (Rank II) NPV Rs.44,615 [Rs. 2,00,000 / Rs. 2,60,000 * Rs. 58,000]

Comment: So, total NPV will be Rs.1,94,615 from Rs. 8,00,000 of investment.

CAPITAL BUDGETING-PART 1

HOW TO CALCULATE RADR USING R_f & R_p

Question No.4(4 Marks) Invest Corporation Ltd. adjusts risk through discount rates by adding various risk premiums to the risk free rate. Depending on the resultant rate, the proposed project is judged to be a low, medium or high risk project.

<u>Risk level</u>	<u>Risk free rate(%)</u>	<u>Risk Premium(%)</u>
Low	8	4
Medium	8	7
High	8	10

DEMONSTRATE the acceptability of the project on the basis of Risk Adjusted rate.

Solution:

Calculation of Risk Adjusted rate:

<u>Risk level</u>	<u>Risk free rate (%)</u>	<u>Risk Premium (%)</u>	<u>Risk adjusted rate (%)</u>
Low	8	4	12
Medium	8	7	15
High	8	10	18

The cash flows of the project considered are as following:

<u>Point in time (yearly intervals)</u>	<u>0</u>	<u>1</u>	<u>2</u>
Cash flow (Rs. in crore)	(100)	45	80

If the project is judged to be Low risk

<u>Years</u>	<u>0</u>	<u>1</u>	<u>2</u>
PV (Rs. in crore)	(100)	$45 / 1 + 0.12 = 40.18$	$80 / (1.12)^2 = 63.78$

$$NPV = 40.18 + 63.78 - 100 = 3.96:$$

Decision: Accept

If the project is judged to be Medium risk

<u>Years</u>	<u>0</u>	<u>1</u>	<u>2</u>
PV (Rs. in crore)	(100)	$45 / 1 + 0.15 = 39.13$	$80 / (1.15)^2 = 60.49$

$$NPV = 39.13 + 60.49 - 100 = (0.38):$$

Decision: Reject

If the project is judged to be High risk

<u>Years</u>	<u>0</u>	<u>1</u>	<u>2</u>
PV (Rs. in crore)	(100)	$45 / 1 + 0.18 = 38.14$	$80 / (1.18)^2 = 57.45$

$$NPV = 38.14 + 57.45 - 100 = (4.41)$$

Decision: Reject

Note: Any other CF can be assumed.

CAPITAL BUDGETING-PART 1

Question No.3 [10 Marks] X Ltd. is considering to select a machine out of two mutually exclusive machines. The company's cost of capital is 15 per cent and corporate tax rate is 30 per cent. Other information relating to both machines is as follows:

	<u>Machine-I</u>	<u>Machine - II</u>
Cost of Machine	Rs. 30,00,000	Rs. 40,00,000

Expected Life	10 years.	10 years.
Annual Income (Before Tax and Depreciation)	12,50,000	Rs. 17,50,000

Depreciation is to be charged on straight line basis:

You are required to CALCULATE: (i) Discounted Pay Back Period (ii) Net Present Value (iii) Profitability Index

The present value factors of Re.1 @ 15% are as follows:

Year	01	02	03	04	05
PV factor @ 15%	0.870	0.756	0.658	0.572	0.497.

Solution:

Depreciation on Machine - I = 30,00,000 / 10 = Rs. 3,00,000

Depreciation on Machine - II = 40,00,000 / 10 = Rs. 4,00,000

Particulars	Machine-I (Rs.)	Machine - II (Rs.)
Annual Income (before Tax and Depreciation)	12,50,000	17,50,000
Less: Depreciation	<u>3,00,000</u>	<u>4,00,000</u>
Annual Income (before Tax)	9,50,000	13,50,000
Less: Tax @ 30%	<u>(2,85,000)</u>	<u>(4,05,000)</u>
Annual Income (after Tax)	6,65,000	9,45,000
Add: Depreciation	<u>3,00,000</u>	<u>4,00,000</u>
Annual Cash Inflows	<u>9,65,000</u>	<u>13,45,000</u>

Year	Machine - I				Machine - II			
	PVF@15%	Cash flow	PV	Cumulative PV	Cash flow	PV	Cumulative PV	
1	0.870	9,65,000	8,39,550	8,39,550	13,45,000	11,70,150	11,70,150	
2	0.756	9,65,000	7,29,540	15,69,090	13,45,000	10,16,820	21,86,970	
3	0.658	9,65,000	6,34,970	22,04,060	13,45,000	8,85,010	30,71,980	
4	0.572	9,65,000	5,51,980	27,56,040	13,45,000	7,69,340	38,41,320	
5	0.497	9,65,000	4,79,605	32,35,645	13,45,000	6,68,465	45,09,785	

(i) Discounted Payback Period

Machine - I

Discounted Payback Period = 4 + (30,00,000 - 27,56,040) / 4,79,605 = 4.5087 years or 4 years 6.10 months

Machine - II

Discounted Payback Period = 4 + (40,00,000 - 38,41,320) / 6,68,465 = 4.2374 years or 4 years 2.85 months

(ii) Net Present Value (NPV)

Machine - I: NPV = 32,35,645 - 30,00,000 = Rs. 2,35,645 ; **Machine - II:** NPV = 45,09,785 - 40,00,000 = Rs. 5,09,785

(iii) Profitability Index: Machine I = 32,35,645 / 30,00,000 = 1.08 ; Machine II = 45,09,785 / 40,00,000 = 1.13

Method	Machine - I	Machine - II	Rank
Discounted Payback Period	4.51 years	4.24 years	II
Net Present Value	Rs. 2,35,645	Rs. 5,09,785	II
Profitability Index	1.08	1.13	II

CAPITAL STRUCTURE

QUESTION NO.1(a) (5 Marks) Stopgo Ltd, an all equity financed company, is considering the repurchase of Rs200 lakhs equity and to replace it with 15% debentures of the same amount. Current market Value of the company is Rs 1140 lakhs and it's cost of capital is 20%. It's Earnings before Interest and Taxes (EBIT) are expected to remain constant in future. It's entire earnings are distributed as dividend. Applicable tax rate is 30 per cent.

You are required to: calculate the impact on the following on account of the change in the capital structure as per MM Hypothesis: (i) The market value of the company (ii) It's cost of capital, and (iii) It's cost of equity

Solution:

(i) Market value of levered firm = Value of unlevered firm + Debenture x Tax Rate

= Rs 1,140 lakhs + (Rs200 lakhs x 0.3) = Rs 1,200 lakhs

The impact is that the market value of the company has increased by Rs 60 lakhs (Rs 1,200 lakhs - Rs 1,140 lakhs)

(ii) Cost of Capital

<u>Components</u>	<u>Amount</u> <u>(Rs In lakhs)</u>	<u>Cost of Capital</u> <u>%</u>	<u>Weight</u>	<u>WACC %</u>
Equity	1000	20.7	83.33	17.25
Debt	<u>200</u>	(15% X 0.7) = 10.5	<u>16.67</u>	<u>1.75</u>
	<u>1200</u>		<u>100</u>	<u>19.00</u>

The impact is that the WACC has fallen by 1% (20% - 19%) due to the benefit of tax relief on debt interest payment.

(iii) Cost of Equity is 20.7% [Refer Working Note-3]

The impact is that cost of equity has risen by 0.7% i.e. 20.7% - 20% due to the presence of financial risk.

Working Note:

1. Calculation Of EBIT : Net income (NI) for equity holders / 0.20 = Rs 1,140 lakhs [Since Company is 100% Equity, Current Value of Company = Current Value Of Equity and also its cost of capital will be equal to Cost of equity] Therefore, Net Income to equity-holders = Rs 228 lakhs

EBIT = Rs 228 lakhs / 0.7 = Rs 325.70 lakhs

2. Calculation Of Income Available To Equity Shareholder:

	<u>(Rs In lakhs)</u>	
	<u>All Equity</u>	<u>Debt of Equity</u>
EBIT	325.70	325.70*
Interest on Rs200 lakhs @ 15%	<u>--</u>	<u>30.00</u>
EBT	325.70	295.70
Tax @ 30 %	<u>97.70</u>	<u>88.70</u>
Income available to equity holders	<u>228</u>	<u>207</u>

* Remember EBIT will always be same for every financing plan.

3. Calculation of Ke After Buyback: $K_e = (\text{Net Income to equity holders} / \text{Equity Value}) \times 100 = (207 \text{ lakhs} / 1200 \text{ lakhs} - 200 \text{ lakhs}) \times 100 = (207 / 1000) \times 100 = 20.7 \%$

LEVERAGES

QUESTION NO.1(5 Marks) The following data have been extracted from the books of LM Ltd:

Sales -Rs.100 lakhs ; Interest Payable per annum - Rs10 lakhs ; Operating leverage -1.2 ; Combined leverage - 2.16

You are required to calculate: (i) The financial leverage, (ii) Fixed cost and (iii) P/V ratio

Solution:

(i) Calculation of Financial Leverage:

Combined Leverage (CL) = Operating Leverage (OL) x Financial Leverage (FL) = 2.16 = 1.2 X FL or FL = 1.8

(ii) Calculation of Fixed cost:

Financial Leverage = EBIT / EBIT - Interest or 1.8 = EBIT / (EBIT-10,00,000) or or EBIT = Rs 22,50,000

Operating Leverage = Contribution / EBIT or 1.2 = Contribution / Rs 22,50,000 or Contribution = Rs 27,00,000

Therefore Fixed Cost = Contribution - EBIT = Rs 27, 00,000 - Rs 22,50,000 or Fixed cost = Rs 4,50,000

(iii) Calculation of P/V ratio: P/Vratio = [Contribution(C) / Sales (S)] X 100 = [27,00 000 / 100,00,00] X 100=27%

RATIO ANALYSIS

QUESTION NO.1(5 Marks) The accountant of Moon Ltd. has reported the following data:

Gross profit	Rs60,000
Gross Profit Margin	20 per cent
Total Assets Turnover	0.30:1
Net Worth to Total Assets	0.90:1

Current Ratio	1.5:1
Liquid Assets to Current Liability	1:1
Credit Sales to Total Sales	0.80:1
Average Collection Period	60 days

Assume 360 days in a year. **You are required to complete the following:**

Balance Sheet of Moon Ltd.

<u>Liabilities</u>		<u>Assets</u>	
Net Worth	xxx	Fixed Assets	xxx
Current Liabilities	xxx	Stock	xxx
		Cash	xxx
		Debtors	xxx
Total Liabilities	<u>xxx</u>	Total Assets	<u>xxx</u>

Solution:

Preparation of Balance Sheet Working Notes:

Sales = Gross Profit / Gross Profit Margin = 60,000 / 0.2 = Rs 3,00,000

Total Assets = Sales / Total Asset Turnover = 3,00,000 / 0.3 = Rs 10,00,000

Net Worth = 0.9 X Total Assets = 0.9 X Rs 10,00,000 = Rs 9,00,000

Current Liability = Total Assets - Net Worth = Rs 10,00,000 - Rs 9,00,000 = Rs 1,00,000

Current Assets = 1.5 x Current Liability = 1.5 x Rs 1,00,000 = Rs 1,50,000

Liquid Assets to Current Liability = 1 or Liquid Assets = Rs 1,00,000

Stock = Current Assets - Liquid Assets or Stock = 1,50,000 - Rs 1,00,000 = Rs.50,000

Debtors = Average Collection Period x Credit Sales / 360 = 60 x 0.8 x 3,00,000 / 360 = Rs 40,000

Cash = Current Assets - Debtors - Stock = Rs 1,50,000 - Rs 40,000 - Rs 50,000 = Rs 60,000

Fixed Assets = Total Assets - Current Assets = Rs 10,00,000 - Rs 1,50,000 = Rs 8,50,000

Balance Sheet

<u>Liabilities</u>		<u>Assets</u>	
Net Worth	9,00,000	Fixed Assets	8,50,000
Current Liabilities	1,00,000.	Stock	50,000
		Debtors	40,000
		Cash	<u>60,000</u>
Total liabilities	<u>10,00,000</u>	Total Assets	<u>10,00,000</u>

BREAKEVEN POINTS

QUESTION NO.1(5 Marks) Sun Ltd. is considering two financing plans. Details of which are as under:

(i) Fund's requirement - Rs100 Lakhs

(ii) Financial Plan

<u>Plan</u>	<u>Equity</u>	<u>Debt</u>
I	100%	-
II	25%	75%

(iii) Cost of debt - 12% p.a.

(iv) Tax Rate - 30%

(v) Equity Share Rs 10 each, issued at a premium of Rs15 per share

(vi) Expected Earnings before Interest and Taxes (EBIT) Rs40 Lakhs

Compute: (i) EPS in each of the plan (ii) The Financial Break Even Point (iii) Indifference point between Plan I and II

Solution:

(i) Computation of Earnings Per Share (EPS)

<u>Plans</u>	<u>I (Rs)</u>	<u>II (Rs)</u>
Earnings before interest & tax (EBIT)	40,00,000	40,00,000

Less: Interest charges (12% of Rs75 lakh)	--	(9,00,000)
Earnings before tax (EBT)	40,00,000	31,00,000
Less: Tax @ 30%	(12,00,000)	(9,30,000)
Earnings after tax (EAT)	28,00,000	21,70,000
No. of equity shares (@ Rs10+Rs15)	4,00,000	1,00,000
E.P.S (Rs)	7.00	21.70

(ii) Computation of Financial Break-even Points

Plan I = 0 - Under this plan there is no interest payment, hence the financial breakeven point will be zero.

Plan II = Rs 9,00,000 - Under this plan there is an interest payment of Rs9,00,000, hence the financial break -even point will be Rs9 lakhs

(iii) Computation of Indifference Point between Plan I and Plan II:

Indifference point is a point where EBIT of Plan-I and Plan-II are equal. This can be calculated by in following manner: [EBIT (1 - 0.3)] / 4,00,000shares = [(EBIT-Rs 9,00,000)(1-0.3)] / 1,00,000shares or EBIT=12,00,000

RATIO ANALYSIS

QUESTION NO.1(a) (5 Marks) Following figures and ratios are related to a company Q Ltd. :

(i) Sales for the year (all credit)	Rs 30,00,000
(ii) Gross Profit ratio	25 per cent
(iii) Fixed assets turnover (based on cost of goods sold)	1.5
(iv) Stock turnover (based on cost of goods sold)	6
(v) Liquid ratio	1: 1
(vi) Current ratio	1. 5: 1
(vii) Receivables (Debtors) collection period	2 months
(viii) Reserves and surplus to share capital	0.6 : 1
(ix) Capital gearing ratio	0.5
(x) Fixed assets to net worth	1.20 : 1

You are required to calculate : Closing stock, Fixed Assets, Current Assets, Debtors and Net worth.

Solution: (i) Calculation of Closing Stock:

Cost of Goods Sold = Sales - Gross Profit (25% of Sales) = Rs 30,00,000 - Rs 7,50,000 = Rs 22,50,000

Closing Stock = Cost of Goods Sold / Stock T turnover = Rs 22,50,000/6 = Rs 3,75,000

(ii) Calculation of Fixed Assets:

Fixed Assets = Cost of Goods Sold / Fixed Assets T turnover = Rs 22,50,000/1.5 = Rs 15,00,000

(iii) Calculation of Current Assets: Current Ratio = 1.5 and Liquid Ratio = 1 ; Stock = 1.5 - 1 = 0.5

Current Assets = Amount of Stock x 1.5/0.5 = Rs 3,75,000 x 1.5/0.5 = Rs 11,25,000

(iv) Calculation of Debtors: Debtors = Sales x Debtors Collection period /12 = Rs 30,00,000 x 2 /12 = Rs 5,00,000

(v) Calculation of Net Worth: Net worth = Fixed Assets /1.2 = Rs 15,00,000/1.2 = Rs 12,50,000

COST OF CAPITAL

QUESTION NO.1(5 Marks) Alpha Ltd. has furnished the following information :

- Earning Per Share (EPS)	Rs 4
- Dividend payout ratio	25%
- Market price per share	Rs 50
- Rate of tax	30%
- Growth rate of dividend	10%

The company wants to raise additional capital of Rs. 10 lakhs including debt of Rs. 4 lakhs. The cost of debt (before tax) is 10% up to Rs. 2 lakhs and 15% beyond that. Compute the after tax cost of equity and debt and also weighted average cost of capital.

Solution:

(i) **Cost of Equity Share Capital (Ke)** : $([25\% \text{ of } 4] / \text{Rs } 50) + 0.10 = 12\%$

(ii) **Cost of Debt (Kd) Interest** : $K_d = (\text{Interest} / \text{Net Proceeds}) \times 100 \times (1-t)$

Interest on first Rs 2,00,000 @ 10% = Rs 20,000 ; Interest on next Rs 2,00,000 @ 15% = Rs30,000

$K_d = [50,000 / 4,00,000] (1-0.3) = 0.0875$ or 8.75 %

(iii) **Weighted Average Cost of Capital (WACC)**

Source of capital	Amount (Rs)	Weights	Cost of Capital (%)	WACC (%)
Equity shares	6,00,000	0.60	12.00	7.20
Debt	4,00,000	0.40	8.75	3.50
Total	10,00,000	1.00		10.70

QUESTION NO.1(5 Marks) Kanoria Enterprises wishes to evaluate two mutually exclusive projects X and Y.

The particulars are as under:

	Project X (Rs)	Project Y (Rs)
Initial Investment	1,20,000	1,20,000
Estimated cash inflows (per annum for 8 years)		
Pessimistic	26,000	12,000
Most Likely	28,000	28,000
Optimistic	36,000	52,000

The cut off rate is 14%. The discount factor at 14% are :

Year	1	2	3	4	5	6	7	8	9
Discount	0.877	0.769	0.675	0.592	0.519	0.456	0.400	0.351	0.308

Advise: management about the acceptability of projects X and Y.

Solution:

The possible outcomes of Project X and Project Y are as follows

Estimates	Estimated Annual Cash inflows	PVF @ 14% for 8 years	PV of Cash Flow (Rs)	NPV (Rs)	Estimated Annual Cash Inflows	PVF @14% for 8 years	PV of Cash Flow (Rs)	NPV (Rs)
Pessimistic	26,000	4.639	1,20,614	614	12,000	4.639	55,668	(-64,332)
Most likely	28,000	4.639	1,29,892	9,892	28,000	4.639	1,29,892	9,892
Optimistic	36,000	4.639	2,41,228	47,004	52,000	4.639	2,41,228	1,21,228

In pessimistic situation project X will be better as it gives low but positive NPV whereas Project Y yield highly negative NPV under this situation. **In most likely situation** both the project will give same result. However, **in optimistic situation** Project Y will be better as it will gives very high NPV.

So, project X is a risk less project as it gives positive NPV in all the situation whereas Y is a risky project as it will result into negative NPV in pessimistic situation and highly positive NPV in optimistic situation.

So acceptability of project will largely depend on the risk taking capacity [Risk seeking i.e those who wants to tale risk]/Risk aversion i.e those who wants to avoid risk) of the management.

SOURCE OF FINANCING

QUESTION NO.2 (10 Marks) RM Steels Limited requires Rs 10,00,000 for construction of a new plant. It is considering three financial plans :

(i) The company may issue 1,00,000 ordinary shares at Rs10 per share;

(ii) The company may issue 50,000 ordinary shares at Rs 10 per share and 5000 debentures of Rs 100 denominations bearing a 8 per cent rate of interest; and

(iii) The company may issue 50,000 ordinary shares at Rs 10 per share and 5,000 preference shares at Rs 100 per share bearing a 8 per cent rate of dividend.

If RM Steels Limited's earnings before interest and taxes are Rs 20,000; Rs 40,000; Rs 80,000; Rs 1,20,000 and

Rs 2,00,000, you are required to compute the earnings per share under each of the three financial plans ? Which alternative would you recommend for RM Steels and why? Tax rate is 50%.

(i) Computation of EPS under three-financial plans

Plan I: Equity Financing

	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)
EBIT	20,000	40,000	80,000	1,20,000	2,00,000
Interest	0	0	0	0	0
EBT	20,000	40,000	80,000	1,20,000	2,00,000
Less: Tax @ 50%	10,000	20,000	40,000	60,000	1,00,000
PAT	10,000	20,000	40,000	60,000	1,00,000
No. of equity shares	1,00,000	1,00,000	1,00,000	1,00,000	1,00,000
EPS	0.10	0.20	0.40	0.60	1

Plan II: Debt - Equity Mix

	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)
EBIT	20,000	40,000	80,000	1,20,000	2,00,000
Less: Interest	40,000	40,000	40,000	40,000	40,000
EBT	(20,000)	0	40,000	80,000	1,60,000
Less: Tax @ 50%	10,000*	0	20,000	40,000	80,000
PAT	(10,000)	0	20,000	40,000	80,000
No. of equity shares	50,000	50,000	50,000	50,000	50,000
EPS	(Rs 0.20)	0	0.40	0.80	1.60

The Company can set off losses against the overall business profit or may carry forward it to next financial years.

Plan III: Preference Shares - Equity Mix

	(Rs)	(Rs)	(Rs)	(Rs)	(Rs)
EBIT	20,000	40,000	80,000	1,20,000	2,00,000
Less: Interest	0	0	0	0	0
EBT	20,000	40,000	80,000	1,20,000	2,00,000
Less: Tax @ 50%	10,000	20,000	40,000	60,000	1,00,000
PAT	10,000	20,000	40,000	60,000	1,00,000
Less: Pref. dividend	40,000*	40,000*	40,000	40,000	40,000
PAT after Pref. dividend.	(30,000)	(20,000)	0	20,000	60,000
No. of Equity shares	50,000	50,000	50,000	50,000	50,000
EPS	(0.60)	(0.40)	0	0.40	1.20

* In case of cumulative preference shares, the company has to pay cumulative dividend to preference shareholders, when company earns sufficient profits.

(ii) From the above EPS computations tables under the three financial plans we can see that when EBIT is Rs 80,000 or more, Plan II: Debt-Equity mix is preferable over the Plan I and Plan III, as rate of EPS is more under this plan. On the other hand an EBIT of less than Rs 80,000, Plan I: Equity Financing has higher EPS than Plan II and Plan III. Plan III Preference share Equity mix is not acceptable at any level of EBIT, as EPS under this plan is lower. The choice of the financing plan will depend on the performance of the company and other macro economic conditions. If the company is expected to have higher operating profit Plan II: Debt - Equity Mix is preferable. Moreover, debt financing gives more benefit due to availability of tax shield.(Saving)

LEVERAGES

QUESTION NO.4 (10 Marks) The capital structure of the Shiva Ltd. consists of equity share capital of Rs 20,00,000 (Share of Rs 100 per value) and Rs 20,00,000 of 10% Debentures, sales increased by 20% from 2,00,000 units to 2,40,000 units, the selling price is Rs 10 per unit; variable costs amount to Rs 6 per unit and fixed expenses amount to Rs 4,00,000. The income tax rate is assumed to be 50%.

(a) You are required to calculate the following: (i) The percentage increase in earnings per share; (ii) Financial leverage at 2,00,000 units and 2,40,000 units. (iii) Operating leverage at 2,00,000 units and 2,40,000 units.
(b) Comment: on the behaviour of operating and Financial leverages in relation to increase in production from 2,00,000 units to 2,40,000 units.

Solution:

(a) Sales in units

	<u>2,00,000 (Rs)</u>	<u>2,40,000(Rs)</u>
Sales Value @ Rs 10 Per Unit	20,00,000	24,00,000
Variable Cost @ Rs 6 per unit	(12,00,000)	(14,40,000)
Contribution	8,00,000	9,60,000
Fixed expenses	(4,00,000)	(4,00,000)
EBIT	4,00,000	5,60,000
Debenture Interest	(2,00,000)	(2,00,000)
EBT	2,00,000	3,60,000
Tax @ 50%	(1,00,000)	(1,80,000)
Profit after tax (PAT)	1,00,000	1,80,000
No of Share	20,000	20,000
Earnings per share (EPS)	5	9
(i) The percentage Increase in EPS	$(4 / 5) \times 100$	
(ii) Financial Leverage = EBIT/EBT	$\frac{Rs4,00,000}{Rs2,00,000} = 2$	$\frac{Rs5,60,000}{Rs3,60,000} = 1.56$
(iii) Operating leverage = Contribution / EBIT	$\frac{Rs8,00,000}{Rs4,00,000} = 2$	$\frac{Rs9,60,000}{Rs5,60,000} = 1.71$

(b) When production is increased from 2,00,000 units to 2,40,000 units both financial leverage and operating leverages reduced from 2 to 1.56 and 1.71 respectively. Reduction in financial leverage and operating leverages signifies reduction in business risk and financial risk.

WORKING CAPITAL REQUIREMENT

QUESTION NO.5 (10 Marks) Bita Limited manufactures used in the steel industry. The following information regarding the company is given for your consideration:

- (i)** Expected level of production 9000 units per annum.
- (ii)** Raw materials are expected to remain in store for an average of two months before issue to production.
- (iii)** Work-in-progress (50 percent complete as to conversion cost) will approximate to 1/2 month's production.
- (iv)** Finished goods remain in warehouse on an average for one month.
- (v)** Credit allowed by suppliers is one month.
- (vi)** Two month's credit is normally allowed to debtors.
- (vii)** A minimum cash balance of Rs67,500 is expected to be maintained.
- (viii)** Cash sales are 75 percent less than the credit sales.
- (ix)** Safety margin of 20 percent to cover unforeseen contingencies.
- (x)** The production pattern is assumed to be even during the year.
- (xi)** The cost structure for Bita Limited Rss product is as follows:

Raw Materials	80 per unit
Direct Labour	20 per unit
Overheads (including depreciation Rs20)	80 per unit
Total Cost	180 per unit
Profit	20 per unit
Selling Price	200 per unit

You are required to: estimate the working capital requirement of Bita limited. Use Cash Cost Approach.

Solution:

Statement showing Estimate of Working Capital Requirement

A. Current Assets

(i) Inventories:

- Raw material inventory (9,000unitsxRs 80) x 2/12months		1,20,000
- Work in Progress:		
Raw material (9,000unitsxRs 80) x 0.5/12months	30,000	
Wages (9,000unitsxRs 20) x 0.5/12months x 50%	3,750	
Overheads (9,000unitsxRs 60) x 0.5 /12months x 50%	<u>11,250</u>	45,000
(Other than Depreciation)		
Finished goods (inventory held for 1 month) (9,000unitsxRs 160) x 1 /12months		1,20,000
(ii) Debtors (for 2 months) (9,000unitsxRs160) x 2 /12months x 80%*		1,92,000
(iii) Cash balance expected		<u>67,500</u>
Total Current assets		5,44,500

B. Current Liabilities

(i) Creditors for Raw material (1 month)

(9,000 unitsxRs 80) x 1 /12months		60,000
Total current liabilities		60,000
Net working capital (A - B)		4,84,500
Add: Safety margin of 20 percent		96,900
Working capital Requirement		5,81,400

Working Notes:

1. Cash sales are 75 percent less than the credit sales. and Total Cost Of Sales is Rs.14,40,000 (9000 x 160)
XXXXXXXXXXXXXXXXXX

2. No information is given regarding lag in payment of wages, hence ignored assuming it is paid regularly.

3.**Note:**COGS and COS are assumed to be same.

SOURCE OF FINANCING

QUESTION NO. 1 (a)(5 Marks) Y Limited requires Rs 50,00,000 for a new project. This project is expected to yield earnings before interest and taxes of Rs 10,00,000. While deciding about the financial plan, the company considers the objective of maximizing earnings per share. It has two alternatives to finance the project - by raising debt Rs 5,00,000 or Rs20,00,000 and the balance, in each case, by issuing Equity Shares. The company's share is currently selling at Rs 300, but is expected to decline to Rs 250 in case the funds are borrowed in excess of Rs 20,00,000. The funds can be borrowed at the rate of 12 percent upto Rs5,00,000 and at 10 percent over Rs5,00,000. The tax rate applicable to the company is 25 percent. Which form of financing should the company choose?

Solution:

Plan I = Raising Debt of Rs 5 lakh + Equity of Rs 45 lakh

Plan II = Raising Debt of Rs 20 lakh + Equity of Rs 30 lakh.

Calculation of Earnings per share (EPS)

Particulars	Financial Plans	
	Plan I (Rs)	Plan II (Rs)
Expected EBIT	10,00,000	10,00,000
Less: Interest (Working Note 1)	<u>(60,000)</u>	<u>(2,10,000)</u>
Earnings before taxes	9,40,000	7,90,000
Less: Taxes @ 25%	<u>(2,35,000)</u>	<u>(1,97,500)</u>
Earnings after taxes (EAT)	7,05,000	5,92,500
Number of shares (Working Note 2)	15,000	10,000

Earnings per share (EPS)	47	59.25
--------------------------	----	-------

Financing Plan II (i.e. Raising debt of Rs 20 lakh and issue of equity share capital of Rs 30 lakh) is the option which maximises the earnings per share.

Working Notes:

1. Calculation of interest on Debt.

Plan I:	(Rs 5,00,000 x 12%)	Rs 60,000	
Plan II:	(Rs 5,00,000 x 12%)	Rs 60,000	
	(Rs 15,00,000 x 10%)	<u>Rs 1,50,000</u>	Rs 2,10,000

2. Number of equity shares to be issued

Plan I: Rs. 45,00,000 / Rs. 300 (Market Price of share) = 15,000 shares

Plan II: Rs 30,00,000 / Rs. 300 (Market Price of share) = 10,000 shares

(*Alternatively, interest on Debt for Plan II can be 20,00,000 X 10% i.e. Rs 2,00,000. accordingly, the EPS for the Plan II will be Rs60)

RATIO ANALYSIS

QUESTION NO.1 (5 Marks) The following is the information of XML Ltd. relate to the year ended 31 -03-2018 :

Gross Profit	20% of Sales
Net Profit	10% of Sales
Inventory Holding period	3 months
Receivable collection period	3 months
Non-Current Assets to Sales	1: 4
Non-Current Assets to Current Assets	1: 2
Current Ratio	2: 1
Non-Current Liabilities to Current Liabilities	1: 1
Share Capital to Reserve and Surplus	4: 1
Non-current Assets as on 31st March, 2017	Rs50,00,000

Assume that:

- (i) No change in Non-Current Assets during the year 2017-18
- (ii) No depreciation charged on Non-Current Assets during the year 2017-18.
- (iii) Ignoring Tax

You are required to: Calculate cost of goods sold, Net profit, Inventory, Receivables and Cash for the year ended on 31st March, 2018

Solution:

Workings: Non Current Assets/Current Assets = 1 / 2 or 50,00,000 / Current Assets = 1 / 2 ;So, Current Assets = Rs 1,00,00,000 ; Now further, Non Current Assets / Sales = 1 / 4 or 50,00,000 / Sales = 1 / 4 So, Sales=Rs 2,00,00,000

Calculation of Cost of Goods sold, Net profit, Inventory, Receivables and Cash:

(i) Cost of Goods Sold (COGS):

Cost of Goods Sold = Sales- Gross Profit = Rs 2,00,00,000 - 20% of Rs 2,00,00,000 = Rs 1,60,00,000

(ii) Net Profit = 10% of Sales = 10% of Rs 2,00,00,000 = Rs 20,00,000

(iii) Inventory: Inventory Holding Period = 12 Months / Inventory Turnover Ratio

OR Inventory Turnover Ratio = 12/ 3 = 4 or

4 = COGS /AverageInventory OR 4 = 1,60,00,000/AverageInventory OR Average or Closing Inventory =Rs 40,00,000

(iv) Receivables : Receivable Collection Period = 12 Months/ ReceivablesTurnover Ratio

Or Receivables Turnover Ratio = 12/ 3 = 4 or Credit Sales / Average Accounts Receivable = 4 or

4 = 2,00,00,000 / Average Accounts Receivable So, Average Accounts Receivables =Rs 50,00,000/-

(v) Cash: Cash = Current Assets - Inventory- Receivables OR Cash = Rs1,00,00,000 - Rs 40,00,000 - Rs 50,00,000 = Rs 10,00,000 (it is assumed that no other current assets are included in the Current Asset)

LEVERAGES

QUESTION NO.2 (10 Marks) Following is the Balance Sheet of Soni Ltd. as on 31st March, 2018:

<u>Liabilities</u>	<u>Amount in Rs</u>
Shareholder's Fund	
Equity Share Capital (Rs10 each)	25,00,000
Reserve and Surplus	5,00,000
Non-Current Liabilities (12 Debentures)	50,00,000
Current Liabilities	<u>20,00,000</u>
Total	<u>1,00,00,000</u>
<u>Assets</u>	<u>Amount in Rs</u>
Non-Current Assets	60,00,000
Current Assets	<u>40,00,000</u>
Total	<u>1,00,00,000</u>

Additional Information: (i) Variable Cost is 60% of Sales. (ii) Fixed Cost p.a. excluding interest Rs20,00,000. (iii) Total Asset Turnover Ratio is 5 times. (iv) Income Tax Rate 25% ; **You required to:** (1) Prepare Income Statement (2) Calculate the following and comment: (a) Operating Leverage (b) Financial Leverage

Solution:

Workings Note: Total Asset Turnover Ratio i.e. Total Sales/Total Assets=5. Hence, Total Sales=Rs 1 Crore x 5=5 Crores

(1) Income Statement (Rs in crore)

Sales	5
Less: Variable cost @ 60%	<u>3</u>
Contribution	2
Less: Fixed cost	<u>0.2</u>
EBIT (Earnings before interest and tax)	1.8
Less: Interest on debentures (12% x 50 lakhs)	<u>0.06</u>
EBT (Earning before tax)	1.74
Less: Tax 25%	<u>0.435</u>
EAT (Earning after tax)	<u>1.305</u>

(2) (a) Operating Leverage = Contribution / EBIT = 2 / 1.8 = 1.111

Comment: It indicates fixed cost in cost structure. It indicates sensitivity of earnings before interest and tax (EBIT) to change in sales at a particular level.

(b) Financial Leverage = EBIT / EBT = 1.8 / 1.74 = 1.03

Comment: The financial leverage is very comfortable since the debt service obligation is small vis-a-vis EBIT.

(c) Combined Leverage = (Contribution / EBIT) x (EBIT / EBT) = 1.11 x 1.03 = 1.15 or Contribution / EBT = 2 / 1.74 = 1.15

Comment: The combined leverage studies the choice of fixed cost in cost structure and choice of debt in capital structure. It studies how sensitive the change in EPS is vis-a-vis change in sales.

The leverages- operating, financial and combined are measures of risk.

CAPITAL BUDGETING-PART 1

QUESTION NO.3 (10 Marks) PD Ltd. an existing company, is planning to introduce a new product with projected life of 8 years. Project cost will be Rs 2,40,00,000. At the end of 8 years no residual value will be realized. Working capital of Rs 30,00,000 will be needed. The 100% capacity of the project is 2,00,000 units p.a. but the Production and Sales Volume is expected are as under:

<u>Year</u>	<u>Number of Units</u>
1	60,000 units
2.	80,000 units

3-5 1,40,000 units

6-8 1,20,000 units

Other Information: (i) Selling price per unit Rs 200 (ii) Variable cost is 40% of sales. (iii) Fixed cost p.a. Rs 30,00,000.

(iv) In addition to these advertisement expenditure will have to be incurred as under:

Year	1	2	3-5	6-8
Expenditure (Rs)	50,00,000	25,00,000	10,00,000	5,00,000

(v) Income Tax is 25%.

(vi) Straight line method of depreciation is permissible for tax.

(vii) Cost of capital is 10%.

(viii) Assume that loss cannot be carried forward.

Present Value Table

Year	1	2	3	4	5	6	7	8
PVF@ 10	0.909	0.826	0.751	0.683	0.621	0.564	0.513	0.467

Advise: about the project acceptability.

Solution: Computation of initial cash outlay (COF)

	(Rs in lakhs)
Project Cost	240
Working Capital	30
	<u>270</u>

Calculation of Cash Inflows (CF):

Years	1	2	3-5	6-8
Sales in units	60,000	80,000	1,40,000	1,20,000
Contribution (Rs 200 x 60% x No. of Unit)	72,00,000	96,00,000	1,68,00,000	1,44,00,000
Less: Fixed cost	30,00,000	30,00,000	30,00,000	30,00,000
Less: Advertisement	50,00,000	25,00,000	10,00,000	5,00,000
Less: Depreciation (24000000/8) = 30,00,000	30,00,000	30,00,000	30,00,000	30,00,000
Profit / (loss)	(38,00,000)	11,00,000	98,00,000	79,00,000
Less: Tax @ 25%	NIL*	2,75,000	24,50,000	19,75,000
Profit/(Loss) after tax	(38,00,000)	8,25,000	73,50,000	59,25,000
Add: Depreciation	30,00,000	30,00,000	30,00,000	30,00,000
Cash inflow	(8,00,000)	38,25,000	1,03,50,000	89,25,000

(Note: Since variable cost is 40%, Contribution shall be 60% of sales)

*Why Nil? Since it is clearly written in question to Assume that loss cannot be carried forward.

Computation of NPV

Year	CF	PVF@ 10%	PV
1	(8,00,000)	0.909	(7,27,200)
2	38,25,000	0.826	31,59,450
3	1,03,50,000	0.751	77,72,850
4	1,03,50,000	0.683	70,69,050
5	1,03,50,000	0.621	64,27,350
6	89,25,000	0.564	50,33,700
7	89,25,000	0.513	45,78,525
8	89,25,000		
Working Capital	30,00,000	0.467	<u>55,68,975</u>
			3,88,82,700
	CO		<u>2,70,00,000</u>
		NPV	<u>1,18,82,700</u>

Recommendation: Accept the project in view of positive NPV.

DEBTOR'S MANAGEMENT

QUESTION NO.4 (10 Marks) MN Ltd. has a current turnover of Rs 30,00,000 p.a. Cost of Sale is 80% of turnover and Bad Debts are 2% of turnover, Cost of Sales includes 70% variable cost and 30% Fixed Cost, while company's required rate of return is 15%. MN Ltd. currently allows 15 days credit to its customer, but it is considering increase this to 45 days credit in order to increase turnover. It has been estimated that this change in policy will increase turnover by 20%, while Bad Debts will increase by 1 %. It is not expected that the policy change will result in an increase in fixed cost and creditors and stock will be unchanged.

Should MN Ltd. introduce the proposed policy? (Assume 360 days year)

Solution:

Statement Showing Evaluation of Credit Policies

<u>Particulars</u>	<u>Present Policy</u>	<u>Proposed Policy</u>
<u>A.Expected Contribution</u>		
(a) Credit Sales	30,00,000	36,00,000
(b) Less: Variable Cost	<u>16,80,000</u> (30 x 80% x 70 %)	<u>20,16,000</u> (36 x 80% x 70%)
(c) Contribution	13,20,000	15,84,000
(d) Less: Bad Debts	<u>60,000</u>	<u>1,08,000</u> (36Lakhs x 3%)
(e) Contribution after Bad debt [(c)-(d)]	12,60,000	14,76,000
<u>B.Opportunity Cost of investment in</u>	15,000	54,000
Receivables		
<u>C.Net Benefits [A-B]</u>	<u>12,45,000</u>	<u>14,22,000</u>
<u>D. Increase in Benefit</u>		1,77,000

Recommendation: Proposed Policy i.e credit from 15 days to 45 days should be implemented by NM Ltd since the net benefit under this policy are higher than those under present policy.

Working Note:

<u>(1)</u>	<u>Present Policy (Rs)</u>	<u>Propose Policy (Rs)</u>
Sales	30,00,000	36,00,000
Cost of Sales (80% of sales)	24,00,000	28,80,000
Variable cost (70% of cost of sales)	16,80,000	20,16,000

2. Opportunity Costs of Average Investments

= Variable Cost x (Collection Period / 360) x Rate Of Return

Present Policy = Rs 24,00,000 x (45 / 360) x 15% = Rs 54,000

Proposed Policy = Rs 28,80,000 x (15 / 360) x 15% = Rs 18,000

CAPITAL STRUCTURE

QUESTION NO.5(10 Marks) The following data relate to two companies belonging to the same risk class :

<u>Particulars</u>	<u>A Ltd.</u>	<u>B Ltd.</u>
Expected Net Operating Income	Rs18,00,000	Rs18,00,000
12% Debt	Rs54,00,000	-
Equity Capitalization Rate	-	18

Required:

(a) Determine the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming no taxes as per M.M. Approach.

(b) Determine the total market value, Equity capitalization rate and weighted average cost of capital for each company assuming 40% taxes as per M.M. Approach.

Solution:

(a) Assuming no tax as per MM Approach.

For B Ltd.:

Total Value of Unlevered Firm (Vu) = [NOI/Ke] = 18,00,000/0.18 = **Rs 1,00,00,000**

K_e of Unlevered Firm (given) = **0.18** ;

K_0 of Unlevered Firm (Same as above = k_e as there is no debt) = **0.18**

For A Ltd.:

Total Value of Levered Firm (V_L) = $V_U + (\text{Debt} \times \text{Nil}) = \text{Rs } 1,00,00,000 + (54,00,000 \times 0\%) = \text{Rs } 1,00,00,000$

Computation of Equity Capitalization Rate and Weighted Average Cost of Capital (WACC)

<u>Particulars</u>	<u>A Ltd.</u>
Net Operating Income (NOI)	18,00,000
Less: Interest on Debt (I)	6,48,000
Earnings of Equity Shareholders (NI)	11,52,000
Total Value of Firm	1,00,00,000
Less: Market Value of Debt	54,00,000
Market Value of Equity (S)	46,00,000
Equity Capitalization Rate [$K_e = \text{NI} / S$]	0.2504

Computation of WACC of A Ltd

<u>Component of Capital</u>	<u>Amount</u>	<u>Weight</u>	<u>Cost of Capital</u>	<u>WACC</u>
Equity	46,00,000	0.46	0.2504	0.1152
Debt	54,00,000	0.54	0.12*	0.0648
Total	81,60,000			0.18

* $K_d = 12\%$ (since there is no tax).

(b) Assuming 40% taxes as per MM Approach

For B Ltd.:

Total Value of unlevered Firm (V_U) = $[\text{NOI} (1 - t) / K_e] = 18,00,000 (1 - 0.40) / 0.18 = \text{Rs } 60,00,000$

K_e of unlevered Firm (given) = **0.18**

K_0 of unlevered Firm (Same as above = K_e as there is no debt) = **0.18**

For A Ltd.:

Total Value of Levered Firm (V_L) = $V_U + (\text{Debt} \times \text{Tax}) = \text{Rs } 60,00,000 + (54,00,000 \times 0.4) = \text{Rs } 81,60,000$

Computation of Equity Capitalization Rate and Weighted Average Cost of Capital (WACC) of a Ltd

<u>Particulars</u>	<u>A Ltd.</u>
Net Operating Income (NOI)	18,00,000
Less: Interest on Debt (I)	6,48,000
Earnings Before Tax (EBT)	11,52,000
Less: Tax @ 40%	4,60,800
Earnings for equity shareholders (NI)	6,91,200
Total Value of Firm (V) as calculated above	81,60,000
Less: Market Value of Debt	54,00,000
Market Value of Equity (S)	27,60,000
Equity Capitalization Rate [$k_e = \text{NI} / S$]	0.2504

Computation of WACC A Ltd

<u>Component of Capital</u>	<u>Amount</u>	<u>Weight</u>	<u>Cost of Capital</u>	<u>WACC</u>
Equity	27,60,000	0.338	0.2504	0.0846
Debt	54,00,000	0.662	0.072*	0.0477
Total	81,60,000	1		0.1323

* $K_d = 12\% (1 - 0.4) = 12\% \times 0.6 = 7.2\%$.